University of Alberta

Factors Influencing Managerial Decisions about Intangible Asset Disclosures: The Role of Accountability Theory and Impression Management

By

Carla Ann Carnaghan ©

A thesis submitted to the Faculty of Graduate Studies and Research in partial fulfillment of the requirements for the degree of Doctor of Philosophy

in

Accounting

Faculty of Business

Edmonton, Alberta

Fall 1999

National Library of Canada
Acquisitions and Bibliographic Services
395 Wellington Street
Ottawa ON K1A 0N4
Canada

Bibliothèque nationale du Canada
Acquisitions et services bibliographiques
395, rue Wellington
Ottawa ON K1A 0N4
Canada

Your file Votre référence

Our file Notre référence

The author has granted a non-exclusive licence allowing the National Library of Canada to reproduce, loan, distribute or sell copies of this thesis in microform, paper or electronic formats.

The author retains ownership of the copyright in this thesis. Neither the thesis nor substantial extracts from it may be printed or otherwise reproduced without the author's permission.

L'auteur a accordé une licence non exclusive permettant à la Bibliothèque nationale du Canada de reproduire, prêter, distribuer ou vendre des copies de cette thèse sous la forme de microfiche/film, de reproduction sur papier ou sur format électronique.

L'auteur conserve la propriété du droit d'auteur qui protège cette thèse. Ni la thèse ni des extraits substantiels de celle-ci ne doivent être imprimés ou autrement reproduits sans son autorisation.

0-612-46814-3

Canada

University of Alberta

Library Release Form

Name of Author: Carla Ann Carnaghan

Title of Thesis: Factors Influencing Managerial Decisions about Intangible Asset Disclosures: The Role of Accountability Theory and Impression Management

Degree: Doctor of Philosophy

Year this Degree Granted: 1999

Permission is hereby granted to the University of Alberta Library to reproduce single copies of this thesis and to lend or sell such copies for private, scholarly, or scientific research purposes only.

The author reserves all other publication and other rights in association with the copyright in the thesis, and except as herein before provided, neither the thesis nor any substantial portion therefore may be printed or otherwise reproduced in any material form whatever without the author's prior written permission.

Carla Carnaghan

79 Gay Crescent
Kitchener, ON
N2A 2C2

Date: August 26, 1999

University of Alberta

Faculty of Graduate Studies and Research

The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research for acceptance, a thesis entitled *Factors Influencing Managerial Decisions about Intangible Asset Disclosures: The Role of Accountability Theory and Impression Management* submitted by Carla Ann Carnaghan in partial fulfillment of the requirements for the degree of Doctor of Philosophy in Accounting.

Dr. Michael Gibbins
(Supervisor)

Dr. James Jiambalvo

Dr. Richard Johnson

Dr. Brad Reid

Dr. Thomas Scott

Dr. Heather Wier

August 25, 1999

This dissertation is dedicated to my husband Rudy

ABSTRACT

This research examines the factors that influence the levels of and changes in disclosures about intangible assets by Canadian companies. Accountability theory (Tetlock 1985) and impression management theory (Schlenker 1980) are the theoretical bases for a framework in which disclosures are used by managers to respond to accountability pressure from analysts and to create a positive image of the company. The framework enables predictions to be made regarding the effects of analyst influence, company size, and the surrounding periods' performance news on current disclosures. The study also examines disclosure as a multi-dimensional construct, consisting of content, the time frame addressed by the disclosure, and whether the information is provided in a quantitative or qualitative form. The relationship between the proposed explanatory factors such as company size, analyst following, performance information, and cross-listing status with each of these disclosure dimensions is examined. The research method uses archival data from Canadian company annual reports and a disclosure index instrument to develop disclosure measures about companies' research and development (R&D) activities for each one of the dimensions.

The results of the study suggest that levels of disclosure are positively associated with company size, analyst following, and the cross-listing of the company on a U.S. exchange, and that the seeking of public financing is associated with higher volumes (levels) of disclosure. The volume of disclosure content and the level of quantitative disclosures are positively associated with being cross-listed, size, and analyst following, but the level of forward looking information is positively associated only with being cross-listed and the returns news of the following period. Changes in disclosure volume are positively associated with current market returns news, but the relation between the changes in the other disclosure dimensions and performance news tends to be in the opposite direction of what was expected or not significant.

ACKNOWLEDGEMENTS

I would like to express my appreciation and gratitude to my dissertation committee of Richard Johnson, Thomas Scott, and especially to my advisor Michael Gibbins for their many good ideas, helpful suggestions, and considerable patience. Thanks also to Heather Wier for her help in working with the TSE and ROB data, and to Heather, Bradford Reid, and James Jiambalvo for their participation in my committee for my defense, and for their excellent suggestions for improvement. Efrim Boritz, Steve Salterio, and Ranjini Sivakumar also provided many useful comments at various points during the development of the dissertation. The late Lane Daley also provided many invaluable comments and insights during the early development of my ideas, and his ideas and sense of humour have been very much missed.

I also thank my family and especially my husband Rudy for their understanding throughout this period. I also very much appreciate the co-operation of the financial analysts who helped validate my disclosure index instrument, and of several senior managers of various companies who agreed to be interviewed regarding disclosure practices and issues. In addition, I have benefited from discussions and support from my fellow Ph.D. students, including Ujwal Kayande, Namrata Malhotra, Trish Reay, Peter Roberts, Roy Suddaby, Valerie Trifts, and especially Julian Andrews.

I also gratefully acknowledge the financial support received from the Social Sciences and Humanities Research Council and the University of Alberta.

TABLE OF CONTENTS

Chapter			Page
1.0	INTRODUCTION		1
2.0	INTANGIBLE ASSETS AND VOLUNTARY DISCLOSURE		4
	2.1	Intangible Assets and GAAP	4
	2.2	Disclosure of Intangible Asset Information as a Substitute for Recognition	6
3.0	LITERATURE REVIEW OF DISCLOSURE RESEARCH		8
	3.1	Studies of Disclosure Levels	8
	3.2	Studies of Voluntary Disclosure	10
	3.3	Studies of the Costs and Benefits of Disclosure	12
	3.4	Psychological and Organizational Theory Based Studies of Disclosure	14
	3.5	Summary of Literature Review	16
4.0	A PROPOSED THEORETICAL PERSPECTIVE ON STUDYING INTANGIBLE ASSET VOLUNTARY DISCLOSURES		18
	4.1	Impression Management Theory	20
	4.2	Accountability Theory	21
	4.3	Integration of the Two Theories and Application to Financial Disclosure	21

5.0 FRAMEWORK AND HYPOTHESES REGARDING INTANGIBLE ASSETS DISCLOSURE 24

5.1 Intangible Asset Disclosure Framework 24

5.2 The Intangible Asset Disclosure Model Resulting from the Framework 29

5.3 Hypotheses 34

5.4 Additional Research Question 41

6.0 RESEARCH DESIGN 42

6.1 Sample Selection 42

6.2 Variable Definitions and Measurement 45

6.3 The Disclosure Index Underlying the Dependent Variables . 49

7.0 ANALYSIS AND RESULTS 55

7.1 Descriptive Statistics 55

7.2 Results and Discussion 60

7.3 General Discussion 68

8.0 CONCLUSIONS 72

REFERENCES 96

Appendix

DISCLOSURE INDEX INSTRUMENT 104

LIST OF TABLES

Table		Page
1.	Definitions of Dependent and Independent Variables	78
2.	Sample Versus Industry Descriptive Statistics	82
3.	Descriptive Statistics	83
4.	Correlations	85
5.	Univariate Regressions Adjusted for Autocorrelation of Disclosure Content on Company Size and Industry	87
6.	Univariate Disclosure Level Regressions Adjusted for Autocorrelation	88
7.	Multivariate Disclosure Level Regressions	90
8.	Univariate Disclosure Change Regressions Adjusted for Autocorrelation	92
9.	Multivariate Disclosure Changes Regressions	94

LIST OF FIGURES

Figure	Page
1. Summary Of Hypotheses	77

CHAPTER 1

INTRODUCTION

This study provides evidence concerning the factors that influence voluntary disclosures about intangible assets by firms for whom such assets are integral to financial performance. Intangible assets disclosure is part of a larger issue concerning voluntary disclosure and the factors that affect management's decisions on whether to disclose non-mandated information. Intangible assets are especially appropriate for studying voluntary disclosure because they are not well represented by the existing financial accounting framework (Wallman 1995; Lev and Sougiannis 1996). While Lev and Sougiannis find that investors may be able to "unravel" the information provided in the financial statements to some extent, there nonetheless is still interest in having additional intangible asset information provided to assist investor decisions (U.S. SEC 1996). However, there is a perception that in many cases management provides such information in a biased fashion or does not provide it at all (O'Reilly 1996; TSE 1995). The results of this study help in understanding the factors that affect managers' disclosure decisions about intangible assets, including the nature of disclosure changes and when such changes might occur. In particular, this study examines the factors which are hypothesized to be related to the volume of information provided, the amount of forward looking information provided, and whether the information is provided in a quantitative or qualitative form. A better understanding of the circumstances under which information is provided and the characteristics which influence the potential usefulness of the information is valuable, given the importance of both the volume and quality of information in the functioning of capital markets as well as the effects of voluntary information provision on the search costs of various stakeholders.

Accountability theory (Tetlock 1985) and impression management theory (Schlenker 1980) are used to create a framework in which intangible asset disclosures are used by managers to respond to accountability pressure from analysts, as well as to create and

maintain a positive image of the company. The theory proposed in this study is that managers are motivated to influence how others view their organization (and by implication judge management's own performance), and correspondingly will make use of disclosures to affect how their analyst audience views them. This approach to studying financial disclosure has antecedents in some existing psychological and organizational theory based studies of disclosure (e.g. Bettman and Weitz 1983; Aerts 1994; Russ 1991). The framework enables predictions to be made of the effects of analyst influence, relative industry performance, and the surrounding earnings news on disclosure levels and changes.

The study contributes to the existing voluntary disclosure literature by providing evidence regarding the factors that are associated with companies' disclosure levels and disclosure changes over time. The study also contributes to the psychological literature on impression management and accountability theory by linking accountability and impression management which has not been done in the published research to date, by examining how people in organizations deal with accountability pressure and impression management over time, and by examining what types of impression management tactics or accountability responses are used in a regulated environment.

The study's research design uses archival data about Canadian firms to determine how the factors hypothesized from an accountability and impression management perspective actually affect changes in and levels of intangible asset disclosure behavior. The disclosure dimensions that are measured are those of content, time frame (whether disclosures are about current events or are forward looking) and presentation (whether information is provided in a qualitative or quantitative form). Disclosure index scores based on company annual reports are used to measure the dependent variables of interest, with regression analysis then used to test the hypothesized relationships between the disclosure measures and the independent variables, such as current earnings news and analyst following.

The analysis indicates that firm size, analyst following, and the cross-listing of the firms on a U.S stock exchange are strongly positively associated with disclosure content and

presentation, and seeking of public financing is also positively associated with higher levels of disclosure content. The provision of forward looking information is positively associated only with being cross-listed and the performance news of the following period. Changes in disclosure content are positively associated with current performance news, but the effects of the past and future performance news on current disclosure changes tended to be either non–significant or in the opposite direction of what was expected. The results thus provide some evidence that accountability pressure and impression management may play a role in disclosure decisions. However, further work is needed to improve the measure of performance, which is key in determining accountability pressure and the need for impression management. Refinement of the measure of changes in disclosure to address selective provision of information by organizations is also required.

The remainder of this document is organized as follows:

- Chapter Two defines intangible assets, and discusses why they are difficult to meaningfully incorporate into financial statements under current GAAP. Some reasons why investors cannot easily compel managers to provide intangible asset information are reviewed to explain why such disclosure should be viewed as voluntary.
- Chapter Three reviews the existing empirical literature on voluntary disclosure;
- Chapter Four proposes an alternative theoretical approach to studying voluntary disclosure, based on impression management and accountability theory.
- Chapter Five outlines the resulting framework to examine the voluntary disclosure of intangible asset information and the associated hypotheses.
- Chapter Six outlines the approach used to test the hypotheses from Chapter Five, including a discussion of the population to be studied, the variables of interest, and the data sources for the variables.
- Chapter Seven discusses the results of the hypothesis testing.
- Chapter Eight discusses the conclusions that can be drawn from the study's results.

CHAPTER 2

INTANGIBLE ASSETS AND VOLUNTARY DISCLOSURE

2.1 Intangible Assets and GAAP

Over the past twenty years, an increasing number of businesses have found that substantial portions of their revenue are generated by items or processes that do not easily fit into the traditional accounting framework (Wallman 1995). These items include brands, the results of research and development (R&D), publishing rights, and intellectual property (such as patents, copyrights, and software) (Arthur Andersen 1992), and are generally described as "intangible", meaning that unlike traditional resources such as equipment and buildings, they lack physical substance. However, it is the other characteristics of intangible "assets" that have led to problems in including them on companies' balance sheets.

The traditional requirements to capitalize an expenditure as an asset are that:

1. The item have the characteristics of an asset, which in Canada means that the item must embody a probable future benefit ; the entity can control access to the benefit; and the transaction or other event giving rise to the entity's right to or control of the benefit must have already occurred (CICA 1997, Section 1000).
2. The item be recognizable, which entails that the item has an appropriate basis of measurement and a reasonable estimate can be made of the amount involved, and that for items involving obtaining or giving up future economic benefits it is probable that such benefits will be obtained or given up (CICA handbook, Section 1000).

However, intangible assets are often perceived not to meet these criteria:

1. The assurance of economic benefits from specific intangible asset expenditures is often questionable (Jennings and Thompson 1996). Conservatism in these cases often leads to expensing of intangible asset expenditures. One solution to this has been to permit capitalization of intangible asset expenditures (such as development costs) only when technological feasibility has been established and a future market can be defined (CICA

Handbook 1997, Section 3450). However, because establishment of technological feasibility often comes late in the development life cycle (Software Publishers Association1996), this criterion means that only a small portion of total development costs is shown on the balance sheet.

2. The ability of an entity to sell an asset is often used as a criterion of control over the asset (e.g. Egginton 1990; Arthur Anderson 1992; O'Reilly 1996). However, intangible assets such as brand equity are not readily transferable by themselves, while other intangibles such as custom software may be perceived as having value only when sold as part of a larger operation.
3. Measurement uncertainty: Reliable cost estimates for intangible assets are more problematic because: (i) many intangible assets are developed internally, meaning that no arms-length transaction is available for valuation; and (ii) it is often difficult to link specific intangible asset expenditures and resulting future revenues (Sonnelitter 1996). While purchased intangible assets do not have an initial measurement problem, there is often uncertainty over the appropriate amortization period to use (Egginton 1990), leading to matching problems.

When managers do capitalize intangible assets, especially internally generated ones, they are criticized by financial analysts and the business press, who suspect opportunism rather than attempts to provide more relevant information (O'Reilly 1996; Saloman 1996). The resulting financial statements for knowledge-based firms are felt to be less relevant than those for companies in more traditional industries (Amir and Lev 1996; Lev and Sougiannis 1996). This has led to concern by the U.S. SEC and the business press (e.g. Stewart 1994, 1995; Wallman, 1995) that financial statements are failing to provide a relevant representation of a key segment of the economy.

2.2 Disclosure of Intangible Asset Information as a Substitute for Recognition

It is not necessary for intangible assets to be recognized to provide useful information to investors or other stakeholders. Financial disclosure, defined by Gibbins, Richardson and Waterhouse (1992, 5) as the "...release outside the organization of information concerning the economic performance, position, or prospects of the organization, particularly as measured in financial terms", can also be used to at least partially meet investors' information needs. Examples of intangible asset disclosures include information about the development of new software products, announcements of regulatory approvals of new pharmaceutical products, details of research and development (R&D) expenditures within the Management Discussion and Analysis (MD&A) section of the annual report, or forecasts of sales of hardware during a presentation. Disclosures do not necessarily need to be provided in financial terms to be value-relevant, as Amir and Lev (1996) have shown.

Investors and analysts in particular as sophisticated consumers of company information would like intangible asset related disclosures to improve their valuation accuracy. Evidence of this interest was provided during a 1996 SEC Symposium on Financial Reporting and Intangible Assets (U.S. SEC 1996) where representatives of the Association for Investment Management and Research (AIMR) expressed interest in having such information, as did the SEC and the Ontario Securities Commission (OSC) representatives present. The Jenkins Committee on Financial Reporting (AICPA, 1994) also concluded that such additional information would be desirable.

Given that documents such as the annual report and press releases already provide a potential forum for intangible asset disclosures, why would managers not be compelled to disclose if the information were truly of interest to investors? Certainly the early analytical work on disclosure (e.g. Grossman 1981; Milgrom 1981; Myerson 1979) found that management would always disclose its private information either due to adverse selection pressures or through contracting to ensure such provision. However, subsequent analytic research has documented that the disclosure principle will not hold under a variety of

circumstances. The factor which seems relevant to intangible assets disclosure is that of proprietary information, which is defined in Dye (1985, 123) as "... information whose disclosure potentially alters a firm's future earnings gross of senior management's compensation". Both Verrecchia (1983) and Dye (1985) find that the existence of proprietary information will permit management to avoid disclosure, since investors will not know whether management's private information is favorable(but costly to disclose), or unfavorable. Management often cites concerns about proprietary costs as affecting disclosure decisions (Gray and Roberts 1989; Entwistle 1997; Gibbins, Richardson and Waterhouse 1990), and to the extent that investors believe these claims, management is unlikely to be compelled to disclose.

The evidence as to how commonly managers choose to provide their intangible asset information is mixed. The SEC and OSC have all commented that such information is rarely provided by managers, based on reviews of annual reports and other disclosures (U.S. SEC 1996). However, a detailed study by Entwistle (1997) of Canadian companies' R&D disclosures in annual reports identified an average of 89 R&D related sentences for 113 Toronto Stock Exchange listed firms who had R&D expenses in their income statements, with a maximum of 350 R&D related sentence by one company, and only 3 companies of the 113 having no R&D related sentences. One conclusion that could be drawn from this study is that while companies may not provide all the valuation-relevant information desired by analysts or regulators, they do provide some information.

The next chapter reviews the existing empirical disclosure literature to determine what factors have been found to be related to disclosure levels and what types of disclosure have been studied to date. This review is used as the basis for better understanding the theoretical perspectives that have been previously used to study disclosure, what factors might affect intangible asset disclosures and to suggest what aspects of disclosure behavior are not currently well understood.

CHAPTER 3

LITERATURE REVIEW OF DISCLOSURE RESEARCH

The focus of this chapter is to identify the factors that have consistently been found to be associated with changes in disclosure levels and with disclosure characteristics such as disclosure content, disclosure hardness, and causal attributions. Studies of information content (i.e. the impact on stock prices of a given type of disclosure such as earnings) or other studies of disclosure effects will not be considered since such studies do not primarily focus on differences in disclosure characteristics among companies, but rather the impact of those disclosures on capital markets.

3.1 Studies of Disclosure Levels

This area of research has examined the relation between volumes of disclosure (often measured by a count of the number of items disclosed) and environmental variables such as firm size, listing status, and economic performance as proxies for the relative costs and benefits of disclosure. Studies which use disclosure indices to measure disclosure levels include Cerf (1961), Singhvi and Desai (1971), Buzby (1975), Chow and Wong-Boren (1987), Cooke (1989), Botosan (1997) and Patton and Zelenka (1997). These studies generally find that company size, listing status, and current financial performance are positively related to the level of disclosure. Firth (1980) also uses a disclosure index and finds a significant relation between smaller companies' use of equity markets and increases in voluntary disclosure, with nearly one third of the sample firms showing a higher level of disclosure than a matched sample and less than five percent having a lower disclosure level. However, Firth finds no similar significant relationship for larger companies.

Other studies have used analyst ratings of disclosure as the proxy for disclosure levels. Lang and Lundholm (1993) examine the relation between analyst ratings and a number of structural and performance variables such as the current year's stock return, current and

subsequent issuance of debt and equity, and the earnings-return correlation over the preceding ten years. Clarkson, Kao, and Richardson (1995) examine factors related to analyst ratings of MD&A disclosures in 1992 Canadian company annual reports. Both of these studies find that firm size, seeking of public financing, and current financial performance are positively related to disclosure ratings. Clarkson et al (1995) also show a positive relation between current disclosure ratings and past disclosure practices, performance in the subsequent year, and press releases. Healy, Palepu and Sweeney (1995) show that increased disclosure ratings are associated with a subsequent increase in public financing.

Gibbins, Richardson, and Waterhouse (1990) examine the number of disclosures across various channels including press releases and annual reports, and find that firms disclose more when they want access to capital markets. Gray and Roberts (1989) find that variables such as size, profitability, and leverage were positively associated with increases in disclosures, while industry classification is also weakly significant in explaining disclosure behavior.

In summary, these studies are useful in establishing the need to control for company size, seeking of public financing, and listing status when examining disclosure levels, and suggest that current and possibly past and future financial performance could also be important in influencing disclosure levels.

3.2 Studies of Voluntary Disclosure

Studies of disclosure in the 1980's and 1990's began to examine the factors affecting specific types of voluntary disclosure. Many of these studies focused on factors associated with the early release of earnings information in the form of management earnings forecasts or pre-emptive earnings announcements (earnings announcements made after the end of the period but before the release of the quarterly or annual report). Such factors may also influence intangible asset disclosures which are also voluntary, and thus are important to consider.

3.2.1 Management forecasts and pre-emptive earnings announcements

Ruland, Tung and George (1990), Frankel, McNichols and Wilson (1995), and Clarkson, Kao, and Richardson (1994) find a positive relation between subsequent public financing and issuance of management forecasts. A number of studies also consider whether forecasts are issued in a biased fashion (i.e. are more likely to be made when subsequent earnings are greater than expectations and less likely otherwise). Penman (1980) shows that forecasts are more likely when the firm has good news, with similar conclusions made in Lev and Penman (1990) and Clarkson, Kao, and Richardson (1994). However, Penman and Lev and Penman use samples with predominately quantitative forecasts from the late 1960's and early 1970's. Baginski and Hassell (1997) and Skinner (1994) consider both qualitative and quantitative forecasts from the 1980's and find more bad news than good news forecasts. These conflicting findings in the relative disclosure of good versus bad news have been attributed to increases in litigation risk over time, although differences in initial sample selection of management forecasts also appear to be an issue.

Baginski and Hassell (1997) also find that the precision of management annual earnings forecasts (defined as whether forecasts were more qualitative or quantitative, with observations classified along a scale from point estimates to range estimates to qualitative statements) increases as analyst following increases and as firm size decreases. Forecasts

tend to be most precise when many analysts follow small firms. Baginski and Hassell's discussion also suggests that bad news is more likely to be provided in qualitative form, but do not provide specific evidence of this. Skinner (1994) does show that good news disclosures tend to be point or range estimates while bad news disclosures tend to be provided in qualitative form, and he also notes considerable cross-sectional variation in voluntary disclosure. However, Kaznik and Lev (1995) find that bigger and more disappointing surprises are more likely to be preceded by earnings or sales specific disclosures (albeit using qualitative language) as opposed to more general disclosures about aspects of operations. However, roughly half the companies provide no type of operating disclosures prior to the surprise.

The variation in previous earnings has also been found to be negatively related to the issuance of management forecasts (Cox 1985; Clarkson, Kao, and Richardson 1994). Factors found to be positively related to the issuance of forecasts include size (Cox 1985; Lev and Penman 1990; Frankel, McNichols and Wilson 1995; Kaznik and Lev 1995); relative performance of the firm's industry (Lev and Penman 1980); and the change in earnings from the previous year (Clarkson, Kao, and Richardson 1994).

In summary, these studies provide further evidence that size and financial performance affect voluntary disclosure. Some of the studies also suggest that the form in which bad news is disclosed is different from that of good news, in that bad news disclosures tend to be more qualitative, while good news disclosures are more quantitative (precise). The relationship between the accuracy of analyst forecasts and the disclosure of management forecasts appears to be mixed, although increased analyst following may increase both the volume and precision of disclosure, especially for small firms.

3.2.2 Studies of other types of voluntary disclosures

Tasker (1997) examines the relationship between conference calls to analysts after quarterly earnings announcements and several proxies for accounting quality (largely based on the relation between market and book value). She finds a positive relationship between companies' use of conference calls and firm size, analyst following, institutional ownership, and past sales growth performance, and a negative relationship between use of conference calls and accounting quality. Entwistle (1997) uses archival data from 1993-1995 annual reports for Canadian firms reporting R&D expense to determine the influence of a number of variables on specific types of R&D disclosures. He finds that the quantity of R&D disclosures is related to industry classification, and that the majority of disclosures describe the actual or potential outcomes of the R&D expenditures, such as new products. Company size is also related to the quantity and subject matter of the R&D disclosures.

These studies provide additional evidence regarding the variability in voluntary disclosure and the importance of company size, analyst following, and industry classification in explaining such variation. Tasker's results also suggest that prior performance may affect disclosure, thus providing additional support for results cited in the previous section.

3.3 Studies of the Costs and Benefits of Disclosure

Several studies have examined managerial perceptions of relative costs and benefits of disclosure, including Chandra and Greenball (1977); Gray and Roberts (1989); Edwards and Smith (1996); and Entwistle (1997). Disclosure benefits provided by managers in these studies include improved image/reputation/credibility, management of expectations, better investment decisions by investors, improved accountability, better investor risk assessment, attraction of "better quality" analysts, and "fairer" share prices. Disclosure costs provided by management include information collection and publication costs and proprietary costs. Gray and Roberts (1989) find that more successful companies want to be

higher profile, while less successful companies prefer to be less visible and thus tend to view voluntary disclosure as less desirable.

Managerial concerns about proprietary costs seem to dominate the other perceived disclosure costs. Results of surveys and interviews of managers seem to consistently list proprietary costs as a reason not to disclose (Gray and Roberts (1989); Edwards and Smith (1996); Entwistle (1997)). Chandra and Greenball (1977), Brancato (1996), and Siegal (1996) also claim managerial concerns about these costs are a reason managers tend not to disclose information. However, the extent to which these concerns are well founded or accurate is unknown. For example, Patel and Pavitt (1995) note that companies have many other ways of learning about R&D other than disclosures. They report that analyzing patent disclosures, consultations with employees of the competition, hiring of employees of the competition, reverse engineering, and independent R&D were all rated as equally or more useful than analysis of publications by more than 600 R&D directors in the U.S.

A few studies have tried to directly measure the costs and consequences of disclosure. Healy, Palepu and Sweeney (1995) find that the companies who increase their disclosure have a significantly greater stock price response to changes in earnings relative to industry peers after the increase in disclosure and a significantly greater response to changes in earnings relative to their own pre-disclosure model. These results hold even for firms that report both positive and negative changes in earnings after the disclosure increase. In general, however, the increased disclosure firms seem to have relatively stable earnings over the period but improved earnings relative to the industry median. Firms who increase their disclosure also have a subsequent increase in analyst following relative to the industry. Botosan (1997) uses a disclosure index to examine whether firms' cost of equity capital varies with disclosure, controlling for the market beta and firm size. She finds that for firms with a small analyst following, greater disclosure was associated with a lower cost of equity capital, but that this relation did not hold for firms with a large analyst following.

In summary, the results of these papers suggest managers perceive disclosure as having both costs and benefits. The results of both these studies and studies cited in earlier sections suggest that managers may be somewhat strategic in making disclosure decisions, and are generally more apt to disclose (whether through forecasts or improving the annual report) when there are reasons to do so, such as a need to raise public financing or because of a desire to make known a relative improvement in financial performance. Studies of realized costs and benefits suggest that additional disclosures do affect stock price, but that firm size and industry effects may moderate these effects.

3.4 Psychological and Organizational Theory Based Studies of Disclosure

This category is distinguished from the other research which has generally been done from an economic perspective (implicit or explicit) to help establish the precedents for the proposed psychologically-based theoretical perspective on disclosure in Chapter Four. Research done from a psychological and organizational theory perspective has tended to focus on differences in the content of disclosures, including causal attributions, and the relationship between organizational or individual characteristics and disclosure behavior.

Causal attributions and the use of impression management tactics in disclosures have been examined in Ingram and Frazier (1983), Bettman and Weitz (1983), Salancik and Meindl (1984), Russ (1991), and Aerts (1994). These studies investigate whether there was systematic bias related to causal explanations, hypothesizing that managers attribute good financial performance to themselves and poor financial performance to public factors. In general, these studies find that management does tend to behave as expected. However, Salancik and Meindl also note that managers of unstable firms are more likely to attribute both good and bad firm performance to internal causes when compared to managers of firms with stable performance, presumably to convey a sense of control. Aerts (1994) reports similar findings. Bettman and Weitz also find that while the proportion of good news attributed to internal causes does not seem affected by industry performance, the

proportion of bad news attributed to public causes does significantly increase in years where the majority of firms in the industry did badly.

Studies such as Cowen, Ferreri and Parker (1987), Patten (1991) and Roberts (1992) examine the factors related to disclosure of social responsibility information, which are useful in understanding whether disclosures are made in response to pressures from stakeholders who are not investors and analysts. These studies find that size and industry category do correlate with some types of social responsibility disclosures, but have mixed findings as to whether there is a statistically significant relationship between financial performance and these types of disclosure.

Gibbins, Richardson and Waterhouse (1990) use interview data to explore disclosure as an organizational process. They find that managers view disclosure as having more negative than positive consequences and as being more linked to negative than positive events. Kohut and Segars (1992) perform a content analysis of management's letter to shareholders from 1989 annual reports to examine corporate communications strategy. They find that firms with low return on equity tend to be more forward looking when compared to firms with high return on equity, perhaps because of a desire to focus on future potential rather than past poor performance. However, both types of firms tend to generally emphasize past performance more than future expectations. The authors speculate the general emphasis on past events may indicate a preference by CEOs to "...discuss a certain past rather than an uncertain future."

Craighead and Hartwick (1997) use Ajzen and Fishbein's (1980) theory of reasoned action to examine the relationship between CEO beliefs about disclosure and firm disclosure activities, based on survey data of disclosure beliefs of Canadian CEOs and press releases regarding earnings performance and corporate strategy. The authors find that differences in beliefs about the costs and benefits of disclosure are related to the number of disclosures made by firms.

In summary, these studies suggest that financial performance may affect disclosures regarding causal attributions. However, disclosures not related to financial performance, such as social responsibility disclosures which may be made in response to non-investor stakeholders, may not be affected. Firms with volatile performance may be less inclined to make public causal attributions than those with more stable performance. Industry and size continue to be important factors in explaining disclosure behavior. The Craighead and Hartwick study also suggests that managerial beliefs about the desirability of disclosure may affect disclosure behavior.

3.5 Summary of Literature Review

The results of the research to date on disclosure behavior suggest the following:

1. Organizational size is strongly positively related to increases in disclosure. Industry classification also seems to be related, although this may be due to industry performance effects in any given year. Analyst following appears to be positively associated with disclosure levels, although size may negatively interact with analyst following in affecting disclosure levels.
2. Whether earnings news is good or bad affects financial disclosure. There is conflicting evidence as to whether good or bad earnings news is more often pre-emptively disclosed as a management forecast, but in general other measures of disclosure such as disclosure precision, the use of conference calls, and analyst ratings of disclosure seem to be positively related to good earnings news. The psychologically-based studies also suggest that good earnings news tends to be attributed internally, while bad earnings news is attributed to external factors.
3. The decision to acquire public financing is positively related to disclosure, although findings conflict on whether the increase in disclosure occurs only in the period prior to seeking financing or whether disclosure increases for a multi-year period prior to the public financing.

4. Both the analytical literature cited in Chapter Two and the disclosure cost/benefits literature cited in Section 3.3 argue that the existence of proprietary costs can affect disclosure, although empirical evidence of this is limited. Managers' beliefs about disclosure, including its costs and benefits, may also influence company disclosure behavior.

CHAPTER 4

A PROPOSED THEORETICAL PERSPECTIVE ON STUDYING INTANGIBLE ASSET VOLUNTARY DISCLOSURES

The economic perspective on disclosure discussed in the preceding section has focused on the factors which affect whether disclosures are made, as well as whether disclosures are provided in a biased manner. Much of this research has implicitly or explicitly focused on the factors believed to affect disclosures' relative costs and benefits, such as the need for public financing, changes in litigation risk, and the desire to signal performance varying substantially from the industry mean or the firm's prior performance. There has been little, if any, research from the economics perspective as to how the presentation or content of disclosure may vary to affect its costs and benefits, despite the finding that bad news is disclosed in a different form than good news.

The psychological perspective has also focused on whether management provides biased information, but additionally has studied how the content of disclosures changes in relation to whether the news is good or bad. The psychological literature has considered how disclosure content may vary to create a particular image of management, but has not considered how explicit costs and benefits of disclosure may affect both the decision to disclose and the content of the disclosure. The interest in many of the economic and psychological studies concerning the effect of stakeholders (such as financial analysts, institutional owners, and employees) on the existence and type of disclosures suggests that the role and power of the audience may also be influential in disclosure. However neither perspective has been very explicit about how and when stakeholders can affect disclosure decisions, and the results to date from empirical studies of the effects of these groups have been mixed.

It is proposed that theories which: (a) place more emphasis on the interaction between the audience and the manager; (b) encompass disclosure as a communication activity; (c) incorporate the concept that managers in making disclosure decisions consider relative costs

and benefits; and (d) can provide some insight into how the content of disclosures may vary in response to factors affecting disclosure costs and benefits, can be useful in better understanding financial disclosure. It is worth noting that a focus on disclosure as an interaction between stakeholders and management parallels results from some of the interview based research, such as Gray and Roberts (1989), who found that disclosures were made when organizations felt themselves to be "misunderstood", and that disclosure was seen as improving reputation. Entwistle (1997) found that managers used disclosure to manage stakeholder expectations and improve credibility. Craighead and Hartwick (1997) also found that managers agreed with statements that referred to providing additional information to lessen the impact of bad news, manage expectations, and build investor confidence to reduce the cost of raising capital.

It is proposed in this study that the theories of accountability (Tetlock, 1985) and impression management (Schlenker, 1980) be used to provide a framework to better explain disclosure behavior. Both of these theories have been previously applied to studying financial disclosure, and are focused on the actions of one party in response to an audience who may have the ability to provide rewards or punishments. The strong emphasis of both of these psychological theories on: (a) the importance of the audience and its expectations; (b) differential information provision and behavior in cases where an individual's behavior is consistent or inconsistent with the audience's expectations; and (c) the individual's implicit consideration of costs and benefits in choosing what to reveal or how to behave, make them appropriate for studying managerial disclosure decisions. Accountability and impression management will be discussed next, along with their relationship to each other.

4.1 Impression Management Theory

Impression management theory (Schlenker 1980; Leary and Kowalski 1990; Bozeman and Kacmar 1997) is based on the idea that people are sensitive to the social significance of their behavior and are therefore motivated to create and preserve desired images in social or public situations (Tetlock and Manstead 1985). Images are chosen to maximize the expected rewards (both psychic and external) associated with a particular image less the expected costs of maintaining that image (Schlenker 1980). Individuals' motivations to create a particular image are determined by the importance of the image to achieving one's goals; the value of the desired goals; and the discrepancy between the desired and current image (Leary and Kowalski, 1990). Schlenker (1980) notes that events that both adversely affect an individual's ability to claim an image and are observed by a stakeholder cause the individual to engage in behavior to minimize or avoid damage to his or her desired image as well as to minimize any negative sanctions that might result. Impression management tactics may also be used to associate an individual with a desirable event, either by maximizing their apparent responsibility or the apparent desirability of an event. These "basking" tactics are most likely to be used when the context does not appear to give an individual credit for a desirable event.

Schlenker lists various ways of associating or disassociating oneself with a particular image including: emphasizing direct, indirect or even tangential links with desired images or positive outcomes, minimizing responsibility for bad events, attempting to reinterpret bad events to make them appear less severe or less representative, avoiding transmittal of unpleasant messages, and attributing success to personal efforts but failure to external factors, bad luck, or other involved individuals. Reality provides a constraint on what images people claim, both through past histories ("track record") and anticipation of future events in which one might have to defend one's image, especially if a stakeholder also may be aware of these other events.

4.2 Accountability Theory

Accountability theory (Tetlock 1985; Tetlock 1983; Weigold and Schlenker 1991) considers individuals' judgments or decision making when their behavior is monitored by a stakeholder (the accountability source) who can create consequences for the individual contingent upon the behavior. It views individuals as politicians, who attempt to determine actions which are acceptable and which minimize cognitive effort. As noted in Tetlock (1992), accountability pressures are reacted to and anticipated by individuals, who may modify their behavior to pre-empt or minimize sanctions based on their understanding of what is desirable. Accountability has been previously applied to accounting and auditing settings (e.g. Gibbins and Newton (1994), Hoffman (1997) and Kennedy (1995)).

Two key behavioral consequences of accountability are that:

1. If the accountability source's preferences are known, accountable individuals will tend to conform to those preferences if there are no conflicting precommitments (Tetlock, Skitka, and Boettger 1989; Tetlock 1983).
2. If the accountability source's preferences are known and the accountable individual can not conform to their preferences because of precommitments, accountable individuals will tend to put more effort into justifying their own position (either retrospectively or prospectively) (Tetlock, Skitka, and Boettger 1989).

4.3 Integration of the Two Theories and Application to Financial Disclosure

There is little consideration in accountability research of what image people wish to project. Instead, emphasis is placed on what actions or attitudes are desired of individuals by the accountability source and how individuals respond to these preferences. The comparison that gives rise to accountability pressure is the difference between the accountability source's preferences and the behavior of the accountable individual. In contrast, impression management focuses on what image people wish to portray to others, and what actions they take to transmit and maintain this image in light of relevant events.

The comparison that gives rise to impression management is thus the relation between the individual's chosen image and relevant events. The audience in an impression management context is seen as relatively passive, with much less consideration of their preferences' potential role in affecting the individual's behavior other than in how it might affect external rewards and punishments for the individual.

One contribution of this research is to combine these two theories by considering the efforts of managers to develop and maintain a desired corporate image which reflects the preferences of an audience who may be able to provide rewards and sanctions. The research approach thus relies on a hybrid of the two theories, drawing from accountability theory's predictions of an individual's subsequent behavior after a comparison of the accountability source's preferences to the individual's initial behavior without explicit consideration of the individual's own preferences, and from impression management theory regarding what individuals do to project and maintain a particular desired image in light of events or actions relevant to this image. This synthesis is in keeping with the impression management model described in Bozeman and Kacmar (1997), and Leary and Kowalski's (1990) characterization of impression management as a two part model, with the first part focusing on the degree to which people are motivated to control how others see them, and the second focusing on the methods used to affect how others see them.

This research also applies these theories to explain management's behavior in developing and protecting a corporate image. The idea of a corporate image is not new in organization theory, having been discussed in such works as Dutton and Dukerich (1991), Elsbach and Sutton (1992), and Ginzel, Kramer, and Sutton (1993). In essence, a corporate image consists of "... the attributes [organizational] members believe people outside the organization use to distinguish it" (Dutton and Dukerich, 1991). Dutton and Dukerich note the importance of corporate image to its members, and the desire of members to take action when they believe the corporate image is threatened. Other studies such as Sutton and Callahan (1987) have found that damage to organizational image is transferred to its

members, and that as a result "... individuals are strongly motivated and committed to take actions that will restore their organization's image" (Dutton and Dukerich, 1991).

The CEO of an organization is often seen as the primary representative of his or her company, and is usually held directly accountable for company performance by virtue of the organizational hierarchy, informal societal role expectations and management compensation schemes. It therefore seems reasonable that CEOs would feel at least as responsible for defending and developing organizational image as other members of the company. As pointed out in Section 3.4, this association between managerial and organizational image is not new, as theories of impression management linking management and their organizations have also already been applied to explain disclosure behavior.

The next section discusses in detail how accountability theory and impression management can be applied in understanding intangible asset disclosures, and the hypotheses that arise from the resulting framework.

CHAPTER 5

FRAMEWORK AND HYPOTHESES REGARDING INTANGIBLE ASSETS DISCLOSURE

5.1 Intangible Asset Disclosure Framework

The theories outlined in Chapter Four suggest that voluntary disclosure can be understood as part of a managerial attempt to create and maintain a particular corporate image (and by implication, a management image) that is preferred by external audiences , including their behavior to address accountability pressure from the external audience. The following framework uses this perspective to identify the factors expected to affect managerial disclosure decisions for companies with significant intangible assets.

5.1.1 The audience

For purposes of this study, the primary audience for intangible asset disclosure is financial analysts[1]. The importance of this audience to management is suggested by Gray and Roberts (1989); Craighead and Hartwick (1997); and Entwistle (1997). Analysts may apply pressure to managers by not making "buy" recommendations, being publicly critical, or no longer following the company. Managers should be particularly aware of analyst influence when seeking public financing. This assumption is in keeping with Schipper's (1991, 105) view of analysts as "...representative of the group to whom financial reporting is and should be addressed". The other key recipients of intangible asset disclosures are competitors, who may use disclosures to appropriate the company's competitive advantage. While this audience may not be the intended audience of disclosures, management is

[1] Institutional investors could also serve as an audience for intangible assets disclosure. However, in Canada data on institutional ownership is only collected every two years, and many of the companies listed as owners are not classified by SIC code or have any other means to readily determine whether the owner is institutional. Examination of the data suggested it was too volatile to make assumptions about the missing years, and as result institutional ownership was not used as a variable in this study.

concerned about the risk of proprietary costs and will thus factor potential competitor actions into their disclosure decisions[1].

5.1.2 Audience preferences about the company (and by extension of management)

The consideration of audience preferences represents a key concept necessary for accountability pressure. It is assumed that analyst preferences are for companies to exhibit "good" performance[2]. This reasonably intuitive assumption underlies much of the research on earnings management and smoothing, and also arises from prior work such as Francis (1993) and Huth (1992). Schipper (1991) also suggests that analysts tend to be optimistic in their earnings forecasts, from which this assumption would follow if analysts prefer to be accurate. Mikhail, Walther, and Willis (1999) suggest that accuracy is in fact important to analysts, so this assumption appears reasonable.

5.1.3 Management's preferred image of the company

Given an audience of analysts, management will wish for their company to be seen by analysts as having "good" performance, so as to be consistent with analysts' preferences. By extension, companies perceived as having good financial performance will reflect well on the management of the company. This alignment of analysts' preferences and management's preferred image of the company reflects the accountability relationship, since the company and management are more likely to be "rewarded" if the company's image meets the accountability source preferences. Given a different accountability source, management's preferred image could be quite different (Carnaghan, Gibbins, and Ikaheimo

---

[1]Papers such as Wagenhofer (1990) note that some disclosures may be aimed at competitors to discourage entry; however the results of managerial surveys cited in section 3.3 regarding disclosure costs suggest that managers are more focused on loss of competitive advantage to competitors than on providing information to discourage entry.

[2]"Good" performance is being used as a generic term, which can encompass both increasing earnings relative to prior performance, and increasing stock price relative to the prior price. However, other factors such as relative performance of the industry/market and expected return to compensate for risk will also affect investors' judgments of whether a company has good or bad performance. The use of both changes in earnings and of stock returns as proxies for performance will be discussed in detail in Section 6.2.

1996), e.g. for an audience of customers, management may wish to stress their company's product quality improvements or charitable donations, rather than good performance.

5.1.4 Past, current and future knowledge of the company's situation or relevant events

This component captures the ongoing nature of the analyst/manager relationship within an environment that mandates some disclosure. Public information includes mandatory disclosures of past and current earnings, other mandatory income statement and balance sheet disclosures, existing intangible asset disclosures, and information that analysts may have from other sources, such as stock prices. Management also has private information about intangible assets and some knowledge of the company's likely future performance. All of the public knowledge as well as management's expectations about the future affects what management will choose to disclose about the company and complicates their impression management efforts.

Intangible asset disclosures can be used to influence the interpretation of performance information by affecting the beliefs about current performance as well as future performance. For example, information about new products in development may help to explain why R&D expenses are higher, making current earnings lower but improving future prospects. This information could affect analysts' beliefs about likely future earnings, and thereby cause the company's stock price to increase. Information about changes in a company's market share may change analysts' perceptions of whether a company's prospects are improving and thus whether current earnings trends are likely to be transitory or permanent, again also affecting stock price. Information about intangible assets in this framework is thus not desired by analysts for its own sake, but rather for valuation.

While both prior and current performance information is available to analysts, current performance information is expected to be most salient, with the prior year's performance expected to have less influence on the current year's disclosures. This

expectation is based on the idea that both the need for impression management and accountability pressure will be predicated upon the most immediate event which provides information about the company and its management, which is current performance. Prior performance's lesser effect on current disclosures is expected to come about by providing a point of comparison as to how "good or bad" current performance is, and because of the effect prior performance has on increasing or decreasing accountability pressure.

Another important type of public information is knowledge of the industry's performance, both because it constrains management's explanations for performance and, like prior earnings, affects analysts' views as to how "bad" or "good" company performance is. This factor has not been extensively studied in the voluntary disclosure literature, but Lev and Penman (1990), Healy, Palepu, and Sweeney (1995), and Aerts (1994) all have findings that suggest that disclosure tends to be positively related to a firm's performance relative to its industry.

5.1.5 The relationship between the preferred image of the company, public information, and management's disclosure decision

The preceding points suggest that performance information will be key in shaping analysts' image of the company and thus in determining accountability pressure and the need for impression management. These forces will in turn affect the decision to disclose intangible assets information. However, the pressures to disclose created by accountability and the need to manage impressions will often be in opposition to each other. Analysts will apply accountability pressure in two cases. The first case results from analysts' perceptions of whether they have adequate information to assess whether the company is conforming to their preferences for improving performance. Analysts will tend to feel that current information is inadequate when it is contradictory, and in this case will pressure management to provide additional information. The second case is when analysts feel that management is not conforming with their preferences (i.e. there is bad performance news),

and management is then pressured to provide indications that they will be conforming with analyst preferences in the future. Analysts may apply this pressure through phone calls, questions during presentations and conference calls, and by publishing their views of the company's current performance and future prospects.

Management's willingness to comply with the accountability pressure in either case will depend on the impression management consequences of providing the desired disclosures. When the company's current performance is good, management will be willing to provide some information about the associated intangible assets to further support the performance information (ignoring proprietary costs), and perhaps some forward looking intangible assets information if it is positive to assure analysts that the good performance will continue.

However, when the company's performance is bad, management will want to provide intangible assets information only if it is likely to cause analysts to improve their image of the company or will somehow cause a reassessment of or distract from the bad performance. Management's private expectations about future performance will also affect their decision, since further damage to the company's image may result if positive implications of an intangible assets disclosure are not borne out by future public performance (i.e. they have a need to maintain credibility).

Therefore, impression management will cause managers to prefer to provide disclosures when they either reinforce a positive image or suggest that the current negative image should be more positive, while accountability pressure will be placed on managers to provide disclosures either when the current image is bad or when the existing information is contradictory. The relative strength of accountability pressure versus impression management needs will thus determine whether intangible asset disclosures are made.

5.2 The Intangible Asset Disclosure Model Resulting from the Framework

5.2.1 Models and independent variables

The basic disclosure model starts with the factors established by previous research as affecting disclosure. As discussed in Chapter Three, these additional factors are company size, industry segment, the seeking of public financing, and regulation. While these factors are not necessarily part of the proposed disclosure framework, all three have major implications for the "amount" of disclosure possible and the extent to which such disclosure is mandated rather than voluntary.

For example, larger companies may be expected to have more to say by virtue of having more products and activities about which to report. Larger companies may also be less dependent on analysts to generate information on their behalf by virtue of having more resources to expend on communications activities, and therefore would be less susceptible to accountability pressure. Company size can thus be viewed within the proposed framework as determining how vulnerable companies are to accountability pressure as well as determining the potential volume of information which could be provided. The industry classification is potentially important because some industries may have established disclosure norms (whether formal or informal) that affect their disclosure levels. Regulation as determined by stock exchanges or securities commissions affect the level of mandated disclosure, which must be controlled for in determining the extent of voluntary disclosure. Listing on some exchanges may also result in greater "visibility" because of more investors or more press reporting of such companies, and thus result in more desire for impression management. The need for public financing as a factor can also be justified within the accountability/impression management framework, since it enables analysts to exert more accountability pressure and provides additional motivation to management to be concerned with their company's corporate image.

The accountability pressure/impression management framework suggests the addition of variables proxying for the audience and past, current and future knowledge of the company's relative performance. The model should thus include analyst following information and company performance information for the surrounding period, as well as industry performance.

It is expected that the basic structural factors such as size and listing will play the major role in determining overall disclosure levels[1].. While accountability pressure and impression management needs resulting from discrepancies between companies' observed and desired behavior will lead to differences in disclosure between years, the overall level of disclosure as determined by these other factors, especially company size, is likely to be more significantThe basic model for explaining disclosure levels which includes both the structural and accountability/impression management factors is therefore:

Disc= f(Pnews, News, Fnews, Nanalyst, Indperf, Extfin, Size, Industry, Listing) (1)

where:

Disc:	The "level " of disclosure of intangible assets information in period t (with the term "level" to be defined in Section 5.2.2)
Pnews, News, Fnews:	Measure of whether performance of the previous period t-1, current period t, and future period t+1 respectively is seen as good or bad
Nanalyst:	Number of analysts following the company
Extfin	A dummy variable indicating whether the company acquired public financing in year t+1
Indperf:	The performance of the company's industry
Size:	The size of the company
Industry:	The industry classification of the company (e.g. software development, biotechnology, computer hardware)
Listing:	The stock exchange the company is listed on

This is clearly a very simplified model of the accountability/impression management framework, but should serve to capture key factors that determine intangible assets

[1] Both the log of R&D expense and R&D expense as a proportion of total assets were also examined as possible control variables. While in some cases these variables was negative and significant at the .05 level for both the disclosure content and disclosure presentation dimensions, they had no effect on the sign or significance of the other variables in the model, and thus had no real effect as control variables.

disclosure. It is this model that provides the basis for the disclosure level hypotheses discussed in Section 5.3. How these variables are measured is discussed in Chapter Six.

This first model focuses on explaining the level of disclosure. Previous research on disclosure such as Gibbins, Richardson and Waterhouse (1990), Entwistle (1997), and Kaznik and Lev (1995) have all noted that disclosure frequency varies significantly among firms even after controlling for such factors as size, industry and performance. As a consequence, even if the hypothesized accountability and impression management factors do affect disclosure levels, detection of these effects may be made more difficult both by the large variation among firms due to other uncontrolled factors and by the major effects of the structural variables on disclosure levels.

An alternative approach to examining the effects of impression management and accountability on disclosure, which controls for this firm-specific variation as well as the structural variables, is to look at changes in the level of disclosure from year to year for individual firms. This approach also suggests that performance should be classified as "good" or "bad" by specifically measuring company performance relative to the previous year. Using a "changes" model results in the removal of the variables for exchange listing and industry, as the values for these variables tend to be stable, meaning that any change equivalent would be close to zero. The company size variable would be removed as a main effect for similar reasons[1]. However, the degree of change in disclosure in response to changes in performance is expected to be a function of the company's susceptibility to accountability pressure. Accordingly, an interaction term between company size and current performance is needed in the disclosure changes model to reflect this expectation.[2]

---

[1] Examination of this assumption was subsequently tested by including change in size as a control variable in the regression analysis. The coefficient on change in size was never significant. The log of changes in R&D expense and change in R&D expense as a proportion of total assets were also examined as possible control variables. Inclusion of these variables had no effect upon the significance or sign of the other variables in the model, and were not themselves significant in explaining disclosure changes.

[2]Obviously, the potential for interaction effects between all three of the news variables and size exists. Given the small sample size and the previously stated assumption that current news is the news variable

The resulting transformation to a "changes" model results in:

CDisc= f(Pnews, News, Fnews, Indperf, Extfin, Size*News) (2)

where:

CDisc:	The change in the "level " of disclosure of intangible assets information in period t (with the term "level" to be defined in Section 5.2.2)
Pnews, News, Fnews:	Performance measure of period t-1 less the performance measure of period t-2, the performance measure of period t less the performance measure of period t-1, and the performance of period t+1 less the performance of period t respectively
Cextfin	An ordinal variable indicating whether the company acquired no public financing in year t and t+1, public financing in year t and year t+1, public financing in year t but not year t+1, or public financing in year t +1 but not in year t
Indperf:	The change in the performance of the company from the previous period t-1 to the current period t
Size*News	An interaction term to capture the effect on disclosure of changes in performance varying by company size.(i.e. susceptibility to accountability pressure as measured by size may result in different magnitudes of disclosure change for an equivalent performance change.)

and the other factors defined as previously given. The hypotheses stated in Section 5.3 concerning changes in intangible assets disclosure will be based on this model, with company performance viewed as the key determinant of accountability pressure and of the need for impression management.

5.2.2 The measurement of disclosure levels as the dependent variable

Before proceeding to the hypotheses, a discussion of the disclosure level variable "Disc" is needed to explain what dimensions of disclosure will be studied. Possible disclosure dimensions according to Gibbins, Richardson, and Waterhouse (1992) are: data content; data organization (classification and presentation); prior or concurrent interpretation provided by the discloser; medium or channel used for communication; timing; redundancy; credibility indicators added by the discloser, and subsequent interpretation provided by the discloser. The "hardness" (quantitativeness versus qualitativeness) of the information released (which might be viewed as one aspect of data presentation) could also be

---

that most affects disclosure, it is preferred to include only one interaction term, which incorporates size and current news changes. Similarly, an interaction between analyst following and current news is also possible, but the high degree of correlation between size and analyst following and the small sample size make inclusion of only one interaction term feasible.

considered as a manageable aspect of disclosure. The manager must choose values for each of these dimensions to develop an intangible asset disclosure. For example, he or she may choose to provide audited measures of the percentage of product returns for each of the past five years during a presentation, including an explanation for why the trend is going down, versus providing a more general statement that product quality is improving in the president's letter to shareholders in the annual report.

While all of these dimensions may be explainable within the proposed framework, the majority of existing disclosure research has focused on content, presentation, timing, and interpretation, which provides a basis for determining how to measure change in these dimensions. The hypotheses therefore consider only these dimensions, which are defined as follows:

1. Disclosure content (volume) Disclosure content can be measured as the number of distinct items of information disclosed in any period, and as such is a proxy for volume of disclosure.

2. Disclosure presentation. It is assumed that analysts prefer more quantitative information regarding intangible assets, on the grounds that such information is more useful for valuation. This disclosure characteristic is also referred to as disclosure "hardness", and is used to exemplify disclosure presentation. An increase in hardness is represented by an increase either in the absolute number of quantitative items disclosed, or by an increase in the relative proportion of quantitative versus qualitative disclosures.

3. Disclosure timing. Timing is defined as the amount of forward looking information provided, and is measured as the proportion of items of forward looking information provided relative to all disclosures, or as the absolute number of forward looking information items provided.

4. Disclosure interpretation. Interpretation for purposes of this study is defined in terms of attributing causality to internal or external causes, in keeping with previous research such as Bettman and Weitz (1983) and Aerts (1994). This will enable the relative proportion of internal attributions with good outcomes to be compared to the proportion of external attributions with good outcomes, for example.

There is no prior research that suggests whether the independent variables suggested by the accountability/impression management framework will affect these disclosure dimensions differently. Accordingly, the approach used is to treat them as alternative proxies for disclosure. Thus, any increase in disclosure content, disclosure hardness, or disclosure timing (in the sense of the provision of forward looking information) is defined as an increase in the disclosure level. Disclosure interpretation is, however, treated separately, as the tendency to make internal versus external attributions does not form a continuum in the same sense that disclosures may be more or less quantitative or represent more or fewer categories of information. Accordingly, hypotheses regarding causal attributions are given separately from the other disclosure dimensions.

5.3 Hypotheses

The following hypotheses arise from the framework of Section 5.1 and are shown on Figure One. Hypotheses H1 through H3d focus on disclosure levels (in keeping with previous research) and are thus based on model (1) -the "levels" model, while Hypotheses H4 through H9 examine disclosure changes and are thus based on model (2) (the "changes" model). Hypothesis H10a and H10b focus on the disclosure interpretation dimension, and as noted above are treated separately from the other hypotheses. To enable comparison with prior disclosure research, two hypotheses involving the control variables (organizational size and industry) found by previous studies to affect disclosure but which are not directly related to the proposed theoretical framework are discussed first. These first

two hypotheses are thus tested to determine whether the current research duplicates prior findings.

In all of the following hypotheses, the term "disclosure" refers only to intangible asset disclosures. The first two hypotheses refer to levels of disclosure content (only); in hypotheses H3-H9 the references to "increases" or "decreases" in disclosure or disclosure levels without further qualification refer to changes in disclosure content (volume), disclosure presentation (hardness), and disclosure timing (provision of forward looking information).

5.3.1 Replication of previous research findings

The first two hypotheses arise directly from previous research and are expected to continue to hold:

H1: Company size is positively associated with disclosure levels.

H2: Disclosure levels vary by industry.

5.3.2 Hypotheses related to the strength of accountability pressure and disclosure levels

Hypothesis H3a-H3d state the effects of the proxies for potential strength of accountability pressure on disclosure, controlling for the other factors included in model (1).

Hypothesis H3a arises from the belief that a greater number of analysts can potentially exert more accountability pressure because of their increased ability to influence investors and focus public attention on the company. The resulting hypothesis is:

H3a: A greater analyst following is associated with higher disclosure levels.

Large organizations generally have greater internal resources to do their own communications and provide their own information to investors. As a result, they are less susceptible to accountability pressure from analysts since they are less dependent on analysts to provide information on their behalf to investors. This results in:

H3b: Large organizations' disclosure levels are less affected by analyst following than small organizations.

Managers should be more prone to accountability pressure from analysts when they are concerned about having a positive public image, as for example when public financing is being sought. As a result, they will generally attempt to provide more information regarding their intangible assets, and will downplay the risk of proprietary costs which might otherwise constrain the information release. This results in:

H3c: Disclosure levels are positively associated with seeking of public financing in the following period.

Many Canadian companies also acquire listings on U.S. stock exchanges, such as NASDAQ or NYSE. While the companies still prepare their reports using Canadian GAAP, the greater "visibility" resulting from being listed on these larger exchanges as well may increase companies' susceptibility to accountability pressure as well as making them use more impression management tactics. This results in:

H3d: Being cross-listed on a U.S. exchange is positively associated with higher levels of disclosure.

5.3.3 Hypotheses related to Accountability Pressure and Impression Management Effects on Disclosure

The following hypotheses are organized around the basic concept mentioned in Section 5.1: that changes in disclosure for an individual company are a function of the performance of the surrounding periods, since this largely determines accountability pressure and the need for impression management. Performance news can either be positive (good) or negative (bad). The hypotheses below state the effects of the performance measures for each of the past, current, and future periods, while controlling for the other factors given in model (2). References to the current year refer to the events and performance of the year in progress or just completed (year t), while references to the prior and following year refer to year t-1 and year t+1 respectively.

1. Effects of the prior period's performance news. In essence, negative prior period news should lead to increases in current period disclosure, while positive prior period news should lead to decreases in current period disclosure. Following bad news, analysts will put additional accountability pressure on management to disclose information to assess future performance, which will affect the current year's disclosure. Even if current news is bad, management will tend to disclose more to deal with the accountability pressure created by the prior bad news. Attempts at concealment or minimization in this case will tend to be used less because the existing public image is already negative, and thus further concealment would be relatively ineffective.

   However, when prior news is good, analysts will have put less pressure on management to disclose more in the current period. If the current news is bad, management will prefer to minimize disclosures in any case to try to reduce emphasis on the current period. This results in:

   H4: Current changes in disclosure are inversely associated with prior period performance news.

2. Effects of the current period's performance news. In the case of current good (positive) news, management is provided an opportunity to "bask", as well as to assure analysts that they are complying with analyst preferences. Ignoring proprietary costs, this would lead to an increase in disclosure. However, the risk of proprietary costs does constrain this increase, with the net effect expected to result in either some increase in disclosure or at least no decrease relative to the previous period.

   In the case of current bad (negative) news, impression management suggests managers should attempt to disassociate themselves from the news by minimizing discussion. While there will be accountability pressure to provide information so as to enable analysts to assess future prospects, management will not be able to assuage this by discussing the intangible assets that resulted in the current period's performance. As a result, management will tend to disclose less (this excludes the effects of expected good future performance on current disclosures, which is discussed next). Disclosure is also more likely to be in qualitative terms, as another means of concealment. The perception of just how relatively good or bad the news is also affected by the industry's performance to which the company belongs. This results in:

   H5: Changes in disclosure are positively associated with current period performance news.

   H6: Changes in disclosure are positively associated with current performance relative to the industry.

3. Effects of the following period's performance expectations. When management believes that future news will be good, there is additional opportunity for basking since the current image will not be contradicted by subsequent events. Provision of good news about the following period will also help distract attention from current bad news, thus helping in impression management. Management may even tend to increase disclosure about current bad news, knowing that this could enhance credibility while at the same

time having the ability to offset these bad news disclosures with the expected future good news. Disclosure of future news may be constrained by proprietary cost concerns, and some concern about heightened analyst expectations. Nonetheless, the overall direction is still expected to be slightly positive.

However, bad news in the following period should be negatively associated with disclosure in the current period: when there is current good news managers will not wish to enhance their corporate image when they will have difficulty maintaining that image in the following period, while if there is current bad news managers will be reluctant to try to provide excuses or justification, knowing that the following year's events are unlikely to support any claims they make. Minimization or concealment is likely to be viewed as the best tactic, since the accountability pressure will not be relieved with further disclosures. This results in:

H7: Expected future performance news is positively associated with changes in current period disclosure.

4. Interaction Effects. While the prior and following years' news is expected to have effects on disclosure changes in the current year, the strength of these effects is expected to be increased in cases where the performance news is changing from negative to positive. This is because both accountability pressure and impression management needs should push managers to make more disclosures in order to repair their image and meet audience preferences. This results in:

H8: The change from bad (negative) news in the past or present period to good (positive) news in the current or following period is positively associated with disclosure changes in the current period.

As noted earlier, larger companies should generally be less dependent on analysts to disseminate information on their behalf, since they can at any time disseminate their own news. As a result, their annual report disclosures should change less in response to bad earnings news, since accountability pressure will be less effective (i.e. larger companies have less need of analysts to disseminate their good news at other times, so they can afford to respond less to accountability pressure to explain their bad news when it occurs). However, impression management tactics are still used in response to good news, regardless of company size, so small and large companies are not expected to have differing magnitudes of disclosure change in response to good news. This results in:

H9: Larger companies have smaller disclosure changes associated with current bad news relative to smaller companies.

5.3.4 Causal attributions

In keeping with prior research on causal attributions, it is expected that managers will blame external events as an impression management tactic to try to deflect blame from their companies and themselves for bad news, but attempt to take credit for good news by making internal attributions. This hypothesis is thus a statement about the relative proportion of causal attributions, rather than about changes or levels of these attributions. The resulting hypotheses are:

H10a: Causal attributions concerning bad news have a higher proportion of external compared to internal attributions.

H10b: Causal attributions concerning good news have a lower proportion of external attributions compared to internal attributions.

5.4 Additional Research Question

The preceding hypotheses make a number of predictions regarding the level of and changes in intangible asset disclosure. There are some other issues regarding disclosure characteristics about which either it is difficult to make hypotheses or for which data availability may be an issue, but which are still of interest. One example of such a question is examining whether changes in management affect disclosure. It may be that the new manager is less affected by prior performance information since it reflects on the previous manager rather than him or herself. The manager may also choose to increase disclosure to highlight improvements made under the new leadership. The new manager may also have different beliefs about disclosure which affect disclosure dimensions. To the extent that the sample supports examination of this issue, the effects of CEO change on disclosure will be considered.

CHAPTER 6

RESEARCH DESIGN

Archival Canadian data was used to test the hypotheses of Chapter Five, as well as to investigate the issue of whether management changes affect disclosure. Use of archival data permit a focus on what managers actually do in response to good and bad earnings news as opposed to what managers claim to do, which has already been examined in Entwistle (1997) and Craighead and Hartwick (1997). The sample selection, data sources, and variables are discussed next.

6.1 Sample Selection

To study intangible assets disclosure differences using the proposed framework it is necessary to define:

1. What types of intangible assets are examined: The intangible asset chosen for investigation in this study is research and development (R&D) expenditures. As noted in Chapter Two, R&D typically does not meet the criteria needed to be treated as an asset in the standard accounting framework. For example, in Canada research expenditures are always expensed, while development expenditures must meet several criteria to be capitalized. Application of these capitalization criteria and apparent accounting conservatism on the part of companies engaged in R&D activities often results in either no capitalization of development expenditures or capitalization of only a small amount of the total expenditures. However, R&D is fundamental to the activities of companies in several industries, which suggests that R&D related disclosures should be important for firms which wish to explain their performance in these industries. R&D is also appropriate for this study because companies or industries who engage significantly in this activity can be identified on the basis of R&D expense, which must be disclosed if material (CICA 1997, Section 1520).

2. A common regulatory environment, so as to minimize disclosure differences due to changes in regulation rather than the explanatory factors of interest: To accomplish this, the disclosure sample was drawn from Canadian companies listed on the Toronto Stock Exchange for the time period 1992-1996. The time period of 1992-1996 also has fairly stable disclosure requirements with respect to R&D, as the OSC's MD&A requirements which might affect such disclosures were implemented in 1989-90[1] (OSC 1993).
   Use of Canadian companies also reduces the effects of litigation on disclosure. Prior research such as Skinner (1994) found that voluntary disclosures in the form of management forecasts varied over time, likely in response to differences in litigation risk. Since this study will also be examining disclosure changes over time, elimination of other potential explanatory factors such as litigation which could affect disclosure changes is important. Litigation risk is low in Canada since shareholder class action suits are rare, and few if any Canadian companies listed on the TSE have been sued or fined for misleading disclosure (Toronto Stock Exchange, 1995).
3. A population frame consisting of companies for whom R&D success is crucial for survival. This ensures that analysts will be interested in seeking information concerning the companies' R&D efforts, thus providing the requisite accountability pressure and the need for impression management concerning R&D activities.
   The approach taken to achieve such a frame was:
   (a) To select companies based on industry membership rather than just by the presence of reported R&D expenditures: This enables selection of companies in industries generally perceived as heavily dependent on their R&D success. It also screens out companies in other industries who may engage in R&D but for whom other activities such as manufacturing may be as or more important. For this study, companies were selected from four industries: biotechnology and pharmaceuticals; computer software and processing; electrical and electronics; and miscellaneous industrial products. These

[1] Clarkson, Kao, and Richardson (1995) note that OSC officials confirmed that by 1992 annual reports should reflect the MD&A regulations specified in policy 5.10.

four industries were chosen on the basis of both the nature of the activity of the companies in these groups (biotechnology, computer technology, and electronics are all commonly cited as examples of "high tech" industries), and the fact that these four segments had considerably more companies reporting R&D expense than any of the other classifications, based on a frequency analysis using the Report on Business Corporate Database (ROB)[1]. An industry-based approach rather than selection of individual companies that report R&D expense also has the advantage of including companies that may only have reported R&D expense in some years. Such companies still have R&D related disclosures to make, but may purchase R&D or have R&D benefits carrying over from other periods.

(b) To refine the industry classifications used: The preceding step selected companies potentially engaged in R&D activities. However, the relatively coarse categorization employed by the ROB's Industry Segment Classification (ISC) resulted in industry groupings (such as miscellaneous industrial products) which also included companies that were primarily engaged in manufacturing rather than R&D related activities. To refine the ISC industry groups, all companies were removed which met the following criteria: (a) had a description in the ROB database which described the company manufacturing products, but which used no term to suggest the company engaged in development or research of products; and (b) reported no R&D data for any of the study period years.

Companies were randomly selected from the resulting population, and were retained for analysis if they had annual reports for at least two consecutive years in the study period, and also had performance proxies available for the years surrounding the annual reports (further details on this are provided in Section 6.2.2). The resulting sample consisted of 56 companies representing 189 firm-year observations, out of a population of 123 companies.

---

[1] The ROB database is used as it provides more complete Canadian company data than does the Compustat database. One drawback of ROB is that it currently lacks Standard Industry Classification (SIC) codes, which have been used in prior research to classify companies by industry. As a result, Industry Segment Classification codes must be used for the initial sample selection.

6.2 Variable Definitions and Measurement

6.2.1 Dependent Variables

In keeping with the discussion in Chapter Five, four different disclosure dimensions are measured: content (volume of disclosure), timing (provision of forward looking information), presentation (provision of quantitative versus qualitative information), and interpretation (causal attributions). The measurement for the first three dimensions is based on a disclosure index, that consists of a list of disclosure items to which companies' annual reports are compared to see which items the report contains. If a disclosure item in the index appeared anywhere in the annual report, it was scored in the index. Multiple appearances of the same disclosure item were only counted once. The total count of the number of items disclosed in each dimension served as the measure of disclosure for that dimension.

For example, if annual report disclosures were judged as matching six of the disclosure index items, with two items in quantitative form and one item disclosed for both the current and future year, then the following counts would result for the first three disclosure dimensions:

(a) The disclosure content dimension would have a value of six, since six distinct items were found in the annual report;

(b) The disclosure timing dimension would have a value of one, since one forward looking disclosure item was provided;

(c) The disclosure presentation dimension would have a value of two, since two of the items were disclosed in quantitative form.

The disclosure interpretation dimension was measured by counting the number of causal attributions for financial performance given in the "Letter to Shareholders" section of the annual report and classifying whether the attribution was for a positive or negative outcome, and whether the cause was internal or external.

Changes in each dimension were calculated by subtracting the disclosure levels of year t-1 from those of year t. To improve the reliability of changes, all annual reports for a given company were coded sequentially to facilitate double-checking of disclosure differences between years.

In cases where it was apparent that a company's annual report could not disclose particular index items because of the company's situation, the index scores for that annual report were dropped from subsequent analysis. For example, a few companies could not report on the index item "5-10 years of sales", because they had not been in business for five years. Other companies were still in their start-up phase, and so could not disclose any product line or other sales information because they had not made any sales yet.

The rationale for and development of the disclosure index is given in Section 6.3. Panel A in Table One lists the definitions used for the dependent variables. Because of the variety of ways that the disclosure dimensions could be measured using the disclosure index, two alternatives proxies for each dimension level and change are given and tested in the subsequent analyses[1] to determine how sensitive results are to measurement differences. Generally, one set of proxies uses as a numerator or denominator what is referred to as a count of "distinct" disclosure items, which means that an item is counted only once if it is disclosed in either current or future form. Counting only distinct items may help to reduce the inherent correlations between different disclosure dimensions by collapsing the disclosure timing dimension to eliminate its effect on the other two dimensions.

Use of different deflators for the alternative timing and presentation measures also helps in analyzing the data from slightly different perspectives. For example, the use of the index maximum for the TIMING1-L variable as a deflator results in a measure of the relative proportion of forward looking disclosures compared to the theoretical maximum number of forward looking disclosures, and thus serves as a measure of the absolute amount of disclosure. In contrast, the use of the total number of distinct items disclosed as a deflator

[1] A variety of proxies were actually tested for each disclosure dimension level and change, using several different deflators. Results were not significantly sensitive to the various approaches used.

results in a measure of the proportion of forward looking disclosures compared to the total number of distinct disclosures made. The difference this makes can be seen by considering that case where a company makes ten disclosures but five are forwarding looking. The TIMING1-L variable will have a low disclosure value for forward looking disclosures (since only five forward looking disclosures were made, out of a theoretical maximum on the index instrument of 33 forward looking items), while TIMING2-L will have a relatively high value (since half of the disclosures made were forward looking).

6.2.2 Independent Variables

The independent variables and their data sources are listed in Panel B of Table One. A few comments on the definitions used follow:

1. Industry classification (INDUST). Selection of companies for the sample required use of the ROB's Industry Segment Classification (ISC), as ROB has no other industry classifier available. However, preliminary analysis of the industry variable using this classification showed no significant industry effects. SIC codes retrieved from the Compact Disclosure CD-ROM were then tested as an alternative, with a two digit level used to ensure there were sufficient companies in each industry classification. In general, most companies whose ISC codes suggested they were involved in R&D intensive industry also had an SIC code indicating membership in an R&D intensive industry. However, the SIC code classification enabled a clearer separation between computer hardware, other electronics companies, and computer software companies. The SIC classification was therefore used for subsequent analysis, with the four industry groupings used being: 28/87 (pharmaceutical and biotechnology companies); 35/37/38 (non-electronic equipment companies); 36/50*[1] (electronic equipment companies) and 73 (software companies). As the groupings indicate, some 2 digit SIC

[1] The specific 50* grouping combined with 36* was the 506* grouping, which refers to companies that wholesale electrical and electronic equipment.

codes were combined in one group to provide adequate group sizes in measuring industry performance.

2. Performance news for surrounding period

There are two basic proxies for measuring the performance news of the surrounding period[1]. One proxy is based on changes in earnings per share. The choice of this proxy is based on earnings being the primary reported piece of public information about companies, which for companies with significant intangible assets should reflect the profitability of past intangible asset expenditures. Earnings information (as a proxy for cash flows) is important to analysts (Maines 1995; Govindarajan 1980) and will therefore be viewed by management as a key determinant of accountability pressure and impression management.

The particular measure of earnings per share to be used is earnings before extraordinary items, which is a widely reported and commented upon number, deemed to be a direct result of management's activities, and as such is expected to generate accountability pressure and the need for impression management. Good news is associated with a positive sign on the change in earnings, while bad news would be represented by a negative sign. PNEWS and FNEWS are equal to the one year lagged and one year ahead values of CNEWS. The closing share price of the first day of fiscal year t is used as a deflator.[2] It should be noted that FNEWS (actual future performance) is a proxy for expected future performance, and thus measures management's expectations with error. To the extent that management's expectations are poorly calibrated with actual future performance, the result will be increased standard error for the coefficient which will bias against finding significant results.

---

[1] Analyst forecasts might also have provided a very useful measure for assessing company performance to expectations. However, the size and nationality of the companies made finding sufficient forecasts for the sample from a source such as I/B/E/S impossible.

[2] The absolute value of earnings was also tested as a deflator. Results of the analysis were qualitatively similar with this choice.

The alternative proxy for performance is the stock returns for the year. Returns are the most commonly used measure of firm performance in capital markets research, and are certainly of primary interest to analysts. Returns are measured over the period starting from the date three days after the release of year t-1's earnings announcement (using the press release date), to the date two days after the release of year t's earnings announcement (which typically two to three months after fiscal year end). The intent of this time period is to capture as much as possible of the reaction to the company's performance for year t, with two days allowed for price to impound year t's earnings announcement given that many of the stocks are thinly traded. This period is approximately one year, but varies because of differences in earnings announcement dates[1].

3. Seeking of public financing

The proxy for management's plans for seeking public financing is the actual acquisition of financing in the subsequent year. If actual acquisition of public financing does not well reflect management's actual plans, this will increase the standard error of the coefficient which will bias against finding results.

6.3 The Disclosure Index Underlying the Dependent Variables

6.3.1 Development of the Disclosure Index

The dependent variables were developed from the voluntary R&D related disclosures in the sample companies' annual reports. There are several approaches to creating measures of disclosures which have been used in prior disclosure studies, including: content analysis, used in Entwistle (1997) and Bettman and Weitz (1983); use of analyst ratings such as

[1] Returns measured over the period starting the second month of the fiscal period and ending one month after the end of the fiscal year were also tested as a proxy. Results of the analysis were qualitatively similar.

Lang and Lundholm (1993) and Clarkson, Kao and Richardson (1995); and use of disclosure indices, used in Botosan (1997), Firth (1980), Cooke (1989) and Singhvi and Desai (1975). Content analysis, which is often done at the sentence or paragraph level, tends to reward redundancy and by counting each sentence or paragraph as a disclosure, tends to give additional points to certain types of disclosures such as product descriptions. Using analyst ratings would require analysts to score nearly 200 reports, which would be extremely time consuming, making cooperation extremely difficult to procure. Such ratings would also tend to reflect analysts' perceptions of the companies' disclosures, which may well be based on criteria other than their stated ones (such differences between apparent judgement criteria and actual judgement criteria have been established by Phelps and Shanteau (1978) and Nisbett and Wilson (1977)).

A disclosure index was therefore used, which relies on developing a list of desirable information items and then reviewing each annual report to determine how many of the items were present. This approach enables good comparisons between companies by using a consistent set of disclosure measures for all companies, does not overweight "wordier" disclosures, and avoids differences in disclosure ratings caused by differences in redundancy.

The disclosure index approach requires careful determination of what items to include in the index so as to ensure construct validity, in keeping with Marston and Shrives' (1991, 195) caution that "The usefulness of the disclosure index as a measure of disclosure is ... critically dependent on the selection of items to be included in the index". In addition, for the disclosure change hypotheses to be testable, the disclosure index had to be sufficiently sensitive to capture disclosure variation among and within companies, but sufficiently objective that disclosures could be reliably measured. These latter two objectives required some tradeoffs, since having many items in the index tends to improve sensitivity to disclosure variation, but also reduces reliability in that coders have more items to look for in

the annual report and have to make more distinctions between items in order to place them into the appropriate categories.

To achieve an index that focused on R&D relevant disclosures of interest to analysts and was sensitive to variation in disclosure, the following steps were taken:

1. Prior research and business press articles which provided a list of desirable disclosures, provided survey results from analysts of desirable disclosures, or listed desirable disclosures from an analyst perspective were reviewed. The material from which disclosures were derived were: The AICPA (Jenkins Committee) report *Improving Business Reporting - A Customer Focus* (AICPA, 1994); Barrett (1976); Belkaoui and Kahl (1978); Botosan (1997); Brown (1992); Buzby (1975); Cato (199); Chow and Wong-Boren (1987); the CICA's monograph *Information to be Included in the Annual Report to Shareholders* (CICA, 1991); Entwistle (1997); Firth (1979); Knutson (1993); Previts et al (1994); Singhvi and Desai (1971); and SRI International (1987). All of the disclosures suggested by these documents, whether apparently relevant to R&D and whether apparently voluntary or now mandated, were compiled into one list of disclosures. The resulting list had over 320 items.
2. The list was then consolidated by removing redundancies, items that are now mandatory, and items that appeared to be unrelated to either the inputs to R&D activities, the R&D activities themselves, or the results (products and associated economic benefits) of the R&D activities. Unrelated items include such things as company history, tax issues, and dividend policy. There is obviously some subjectivity in the decision as to which items provide information indirectly about R&D, so in the interests of parsimony the index focuses more on direct R&D disclosures. While this may result in a more conservative index, it also is expected to be more focused on R&D. In the event that important indirect R&D disclosure items were inadvertently removed from the index during this stage, it is likely that the review of the index by the financial analysts would have detected this (see Step 4).

3. Some index refinement was done by coding some annual reports with two coders to determine whether disclosure items could be readily distinguished from each other. The results were used to collapse similar items, as well as to refine the coding instructions[1]. Disclosure items were also grouped under headings to facilitate finding of particular items by the coders.
4. The final disclosure index refinement was done by removing items not mentioned as important by Canadian financial analysts who had reviewed the list, and by comparing the resulting list to the frequency of mention of these items across the original source documents. *Nelson's Directory of Investment Research* (1997) was used as the source of analysts' names and phone numbers, as well as to select only analysts who followed computer or biotechnology companies. Six analysts reviewed the list and discussed which of the items they felt were important, which were irrelevant, and what items might be added. Items that were regarded by the majority of analysts as unneeded were dropped. Few suggestions for additions to the index were received, and no suggestion for addition was provided by more than one analyst. Of the 32 items remaining on the list, 22 were listed by four or more of the source documents, providing some additional assurance regarding the validity of the list. To ensure the disclosure index was sensitive to variations in disclosure, ten items mentioned by four or more of the source documents were added to the 32 items for which the analysts had a consensus of desirability, resulting in a final disclosure index of 42 items.

A sample of the final disclosure index is shown in Appendix A.

6.3.2 Assessing the Reliability of the Disclosure Index

After the disclosure index was finalized, nine annual reports were coded by two coders to develop measures of inter-rater reliability for the various disclosure dimensions. The

---

[1] The coding instructions provided additional explanation of the disclosure items to help distinguish one item from another. They also explained what a causal attribution was and how to decide whether causes were internal or external.

choice of reliability measure needed to take into account: (a) The level of agreement expected by chance, as suggested by Krippendorf (1980) and Hughes and Garrett (1990); and (b) the level of measurement (e.g. nominal versus ordinal) the data represent. Unlike cases where coding is done to develop a nominal data measure (i.e. the object of interest is placed into one of several unordered categories), in this case the index explicitly ranks annual reports on each one of three dimensions representing disclosure content, timing, and presentation. For example, the disclosure content dimension requires that the number of disclosure items present in each annual report be counted and totaled. The resulting total represents at least interval data, since the measurement of changes requires that the differences between disclosure levels be meaningful.

Accordingly, Krippendorf's alpha for interval data (Krippendorf, 1980) was calculated to measure inter-rater reliability, since this measure removes the agreement expected by chance from the observed agreement in calculating the reliability, and is intended for interval data. Krippendorf's alpha will have a value of one when there is no disagreement in the inter-coder ratings, and a value of zero when the observed agreement is what would have been expected by chance. Reliability calculations were carried out using a SAS macro developed, validated, and discussed in Kang, Kara, Laskey and Seaton (1993), using both the theoretical maximum of disclosure items (i.e. the maximum number of items in the index) and the observed maximum number of disclosure items in the inter-rater sample of 25.[1] The resulting reliability measure for the total number of disclosures was 0.72, meaning that the observed agreement for the count of the total number of disclosures was 72% better than would have been expected by chance alone.

Also following Krippendorf's (1980) discussion, the conditional reliability of disclosure timeliness (i.e. the number of forward looking disclosures) and disclosure presentation were calculated, rather than standard reliability, since calculations of the proportion of forward

[1] The maximum number of categories is used in the reliability statistic to determine what level of agreement should be observed by chance. A smaller number of categories means that there is a greater likelihood of agreement by chance, resulting in a more conservative measure of how reliable the observed level of agreement is after removing the likelihood of chance agreement.

looking and quantitative disclosures first require assessment of what disclosures are present. Conditional reliability removes the effects of disagreement about what disclosures are present (which are reflected in the reliability measure for total number of disclosures) to measure the level of agreement about disclosure timeliness and presentation amongst the disclosures for which there is agreement as to their existence. The resulting conditional reliability measures for disclosure timeliness and presentation respectively are 0.95 and 0.66 (or 95% and 66% better than chance), using Krippendorf's alpha statistic.

Determining whether these reliability levels are acceptable is somewhat difficult, since there is no particular consensus regarding the reliability level that must be achieved for data to be usable. Krippendorf suggests that variables only be used if their reliability is above 0.80, with data whose reliability is between 0.67 and 0.80 used for exploratory work. Nunnally (1967) however suggests that for exploratory work reliability in the range .0.5-0.6 is sufficient, and that for basic research increasing reliability beyond 0.8 will result in little improvement in correlations. Given the exploratory nature of this work, the levels of reliability found seem tolerable, but will tend to add noise to the resulting measures. This will in turn tend to reduce statistical significance, thus reducing the likelihood of spurious findings. Examination of the sources of error in coding suggest that the primary cause of error is missing disclosures that are present in the annual reports, likely because of the difficulty in locating specific items in dozens of pages of narrative. Only a few errors resulted from disagreement about how to code a particular disclosure once it was found. This suggests that the disclosure frequencies will tend to be slightly lower than the actual values, but this error does not appear to be systematically related to any of the independent variables of interest.

CHAPTER 7

ANALYSIS AND RESULTS

This chapter will discuss the results of the hypothesis testing using the models described in Chapter Five. As discussed in Chapter Six, the sample originally consisted of 189 firm year observations, but some observations were dropped where companies clearly did not have all of the information available to report. The final sample thus consisted of a maximum of 140 firm-year observations for the disclosure level hypotheses, and a maximum of 100 observations for the disclosure change hypotheses. There were typically more observations available for the models using returns rather than earnings based news proxies, because of differences in the underlying files providing the data. Comparative statistics between the sample and the industry and additional sample descriptive statistics are provided first, followed by the results and discussion of the hypothesis testing.

7.1 Descriptive Statistics

Table Two shows some comparative statistics by industry between the sample and the population. There are comparatively few sample biotechnology companies compared to the biotechnology population because a large number of the companies with incomplete disclosure indices were in this industry. The remaining biotechnology firms are also much larger than their industry mean, since they tend to be older and more established firms, compared to the many start-ups in the industry population. As a whole, the sample firms tend to have greater average assets and R&D expenses compared to their industry counterparts for the same reason. Sample mean EPS in some cases varies considerably from the industry mean, perhaps due to the skewing effects of outliers in either the sample or the industry.

Table Three shows the number of observations, means, medians, and variances for the dependent and independent variables. It also shows the unscaled values for both disclosure

levels and changes for the various disclosure dimensions. The average number of distinct disclosures per annual report is 15.5, out of a possible index maximum of 41 distinct disclosures. Given the index represents a conservative list of desired disclosures which was derived from a much larger list, this score suggests a relatively low level of voluntary disclosure. Such a finding is in keeping with analyst comments made to a TSE committee studying disclosure improvements (Toronto Stock Exchange, 1995) that Canadian companies generally had low levels of voluntary disclosure. The mean number of future-oriented disclosures and distinct quantitative disclosures is also very low, averaging approximately 3 disclosures out of a potential index maximum of 33 and 6.67 out of a potential maximum of 36, respectively. While not shown in the table, the maximum(minimum) disclosures recorded for the number of distinct disclosures, number of future-oriented disclosures, and number of distinct quantitative disclosures were 24(3), 20(0), and 15(0) respectively. A relatively small number of companies made causal attributions regarding performance in their "letter to shareholders" section, with only 33 annual reports having causal attributions regarding negative outcomes and 69 annual reports having causal attributions regarding positive outcomes. The number of positive causal attributions is more than twice that for negative causal attributions.

Table Three Panel A also reports the log value for analyst following. When transformed back into raw scores, the average (median) number of analysts for each firm-year observation is 6.1, (4.5), with 21% of firm-year observations having no analyst following. It is worth noting however that *Nelson's Directory of Investment Research*, which was the source of analyst coverage information, considerably expanded their coverage of Canadian investment houses over the study period. As a consequence, many of the zero values reported are for the early years in the sample period, and it is quite likely that a number of these firms did in fact have analyst followings which were simply not reported in

Nelson's Directory.[1] This issues adds noise to the measure of analyst following, and will tend to bias against finding a significant effect of analyst following.

Most of the means and medians for the disclosure level dependent variables are quite similar, suggesting little skewness in the distributions. However, the means and medians for the current, past and future news proxies vary considerably, and indicate in all cases that some large positive values for news are skewing the results. The industry performance means also appear quite different from the company performance means (the CNEWS proxies), with the industry means for both earnings and returns news appearing considerably smaller than the sample means for the equivalent measures. This may also be because newer (and thus likely smaller) firms were more likely to be eliminated from the final sample because of incomplete information, leaving older (and presumably larger) firms who are more likely to have positive earnings and returns.

Panel B of Table Three provides information about the dependent and independent variables for the disclosure changes models (the first three rows show the absolute values of the changes in disclosure for the three main disclosure dimensions). The data indicate that some degree of change is occurring, and relative to the low level of disclosure across the three dimensions the change values are large. While not shown in Table Three, the maximum (minimum) change recorded for the number of distinct disclosures, number of distinct quantitative disclosures, and the number of future-oriented disclosures is 7 (-6), 6 (-6), and 8 (-3) respectively. The data also show that the disclosure changes are, on average, positive, as are the changes in earnings and returns news proxies. The news proxies for the disclosure changes are a subset of those for the disclosure levels, so as expected the means and medians are similar to those shown in Panel A. The values for NEWSCHANGE-E and NEWSCHANGE-R indicate that changes from bad to good news (either in the form of bad news in year t-1 and good news in year t or bad news in year t and good news in year

[1] Another consequence of this change in coverage by *Nelson's Directory* was that a meaningful measure of change in analyst following from year to year could not be constructed, since it was impossible to know whether the change was the result of the change in coverage or because of an actual change in the number of analysts following the firm.

t+1) are quite common in the sample. Further examination of the mean value shown for CEXTFIN shows that 85% of the observations have a value of 0 (because seeking of public debt or equity in successive years was rare in the sample), 7% of the observations have a value of 1, and 8% of the observations had a value of –1.

Table Four shows the Pearson and Spearman correlations between the dependent[1] and independent variables, with Panel A showing the disclosure level variables and Panel B showing the disclosure changes variables (only one proxy for each of the content, timing, and presentation disclosure dimensions are shown to keep the table size manageable). The Pearson correlation part of Panel A shows that analyst following, and being cross-listed on a U.S. exchange all have significant positive correlations with the disclosure content, timing and presentation levels. Company size and the need for public financing in the following year is significantly positively correlated with the disclosure content and presentation dimension. The performance news proxies generally appear to have no correlation with any of the three disclosure dimensions, except one weakly significant negative correlation between the prior year earnings news proxy and the content dimension. The Spearman correlations show similar relationships between the dependent and independent variables.

The three disclosure dimensions in Panel A are strongly positively correlated with each other, as expected, although the association between disclosure timing and disclosure presentation is somewhat less than the relation between disclosure content and the other two variables. An examination of the correlations of the alternative disclosure dimension proxies not included in the table show much lower Pearson correlations, with content and timing having a correlation of .138, content and presentation having a correlation of .279, and timing and presentation having a correlation of -.32. While all of these correlations are significant at the .10 confidence level or better, the correlations using distinct measures are

---

[1] The hypotheses that concern the disclosure interpretation dimension require only a comparison of differences in the proportion of external to internal attributions depending on whether the associated outcomes are positive or negative. Since no hypotheses propose that this dimension should be associated with the variables used to explain the other disclosure dimensions, the correlation tables and discussion of the regression results will include only the other three disclosure dimensions: content, timing, and presentation.

much lower in comparison to use of measures where the timing dimension is not collapsed. The negative correlation between timing and presentation using the distinct measure is likely due to the fact that the future-oriented disclosures when coded were much more likely to be qualitative than disclosures about the present.

Among the independent variables, analyst following and firm size are also strongly positively correlated, as expected, and analyst following also has a weak positive relation with the firm being cross-listed. Analyst following is also correlated with the three earnings news proxies. The earnings news proxies tend to be significantly correlated with each other, but this is at least partly because of their construction. It is also worth noting that the two sets of news proxies' Pearson correlations are not significant with each other, whereas the Spearman correlations are significant. This difference may be due to the effects of outliers, or because of differences in what the two proxies are measuring. While not shown in Table Four, the industry dummy variable for the software industry is significantly negatively correlated with size, and positively correlated with industry market and earnings performance, current earnings and returns news, and past earnings and returns news. The electronics industry dummy variable is positively correlated with size and analyst following, and negatively associated with industry earnings performance. Neither of the other two industry dummy variables had significant correlations with any other variables.

Panel B of Table Four shows the correlations between disclosure changes and the explanatory variables. Like the disclosure levels, the disclosure changes for the three dimensions are highly correlated with each other. The earnings news variables are not significantly correlated with the disclosure changes, whereas the returns news variables are correlated with the changes in volume of disclosure and the provision of quantitative disclosures. The current and future returns and earnings news proxies are also significantly correlated with each other.

Because the complete sample represents pooled cross-sectional data, analyses were also performed to determine whether autocorrelation was a concern. For the disclosure level model, the degree of first order autocorrelation varies depending on the model used and the disclosure dimension being analyzed. For example, when using the earnings news proxies model, the residual errors from the regression of the disclosure content dimension variables CONTENT1-L and CONTENT2-L have first order autocorrelation coefficients of -.271 and -.414 respectively, while the residual errors from the regression of the disclosure timing variables TIMING1-L and TIMING2-L have first order autocorrelation coefficient of -.045 and -.082 and the residuals from the regression of the disclosure presentation variables PRESENT1-L and PRESENT2-L have first order autocorrelation coefficients of -.498 and -.392. In general the disclosure presentation and disclosure content dimension models have the greatest degree of autocorrelation and the disclosure timing dimension models have the least autocorrelation. Examination of the disclosure level variables for second order autocorrelation show little if any present.

The disclosure changes models show much less evidence of autocorrelation, with the CONTENT1-C models using the returns news proxies having a first order autocorrelation coefficient of -.233 and CONTENT2-C having a first order autocorrelation coefficient of -.279. The other models all have autocorrelation coefficients of less than .10.

7.2 Results and Discussion

7.2.1 Hypotheses Related to Disclosure Levels

Hypothesis testing for disclosure levels was carried out using multiple regression techniques. Two main methods were used to address some of the problematic characteristics of the data. First, generalized least squares (GLS) regressions adjusted for the presence of autocorrelation were used to individually regress each of the three main disclosure dimensions against the explanatory variables. Second, the strong correlation of the

disclosure dimensions with each other suggested that a multivariate general linear model (GLM) regression approach should also be used so that the covariance matrix reflected the correlations of the disclosure dimensions with each other. Tests of the data for multicollinearity showed low or moderate levels (Jobson, 1991), with condition indices of 13 and below without the Size*Lanlyst interaction term and between 13 and 18 with the interaction term included. Tests of the model for heteroskedasticity using White's test (White, 1980) showed no significant levels.

Hypotheses H1 and H2

To test hypotheses H1 and H2, GLS regressions adjusted for autocorrelation of the two disclosure content proxies on the company size and industry dummy variables were performed, with the regression performed on the two explanatory variables both separately and jointly. Results are shown in Table Five, with the biotechnology industry effect included in the intercept. Regression results show that for both disclosure content variables, company size is positive and significant at the .001 level, indicating that larger companies do have a greater number of disclosures and thus supporting H1. All of the dummy industry variables also show a significant relation with the two disclosure content measures, suggesting that the volume of disclosure does vary by industry and thus supporting H2. When size and the industry dummy variables are all included in the regression, the electronics industry dummy variable becomes non-significant, indicating that it does not differ significantly from the biotechnology firm disclosure content levels once size is controlled for.

Hypotheses H3a-H3d

Regression results using one dependent variable per regression and adjusted for autocorrelation are shown in Table Six. Panel A shows the estimated regression coefficients using the earnings based news proxies, while Panel B shows the estimated regression coefficients using the returns based news proxies. Table Seven shows the results of the multivariate regression. In both Table Six and Seven, SIZE is included as the

dummy variable DSIZE representing large versus small companies and an interaction variable combining DSIZE and LANLYST to test Hypothesis 3b is also included.

Both Tables Six and Seven show the coefficient on the analyst following variable as significant and positive for the disclosure content and presentation measures but not for the disclosure time orientation variables. These results suggest that analyst following is associated with increases in the volume of disclosure and disclosure quantitativeness, but has much less or no relation to the provision of forward looking disclosures. Thus, hypothesis H3a is supported for increases in disclosure volume and disclosure quantitativeness, but not for increases in the number of forward looking disclosures.

An interaction term was included in the models to test Hypothesis 3b which states that large organizations' disclosure levels are less affected by analyst following than small organizations. The coefficient on the interaction term was negative and significant for both the disclosure content and disclosure presentation in the univariate models, but was significant only for the disclosure content dimension in the multivariate model. This would suggest that large organizations' volume of information disclosed is less affected by analyst following than that of small organizations, but that the provision of quantitative and forward looking information is not differentially affected, especially once the volume of information differences are controlled for.

Table Six also shows the estimated coefficients for the EXTFIN variable, which is needed to test Hypothesis H3c that disclosure levels are positively associated with the seeking of public financing in the following period. The only model in which the coefficient on EXTFIN is significant and positive is that of the univariate model using market based news proxies. It thus appears that there is limited support for Hypothesis H3c, and that the seeking of public financing does not affect either the provision of more quantitative disclosures or of more forward looking information.

Hypothesis H3d requires that the coefficient on CROSS-LIST be positive and significant. An examination of Tables Six and Seven shows that this is the case for the

disclosure content and timing dimensions for the univariate earnings models and for all three dimensions for the multivariate models. However, the second version of the disclosure dimension measures for timing and presentation have insignificant coefficients, suggesting that the relative proportion of forward looking and quantitative disclosures is not affected by cross listing, but that the volume of forward looking and quantitative disclosure is, even after controlling for the volume of disclosure in general. There is therefore strong support for cross-listing on U.S. exchanges having a positive relation with disclosure volume and an increase in forward looking disclosures, and some support for cross-listing being related to increases in the provision of quantitative disclosures.

7.2.2 Hypotheses Related to Disclosure Changes

Hypothesis testing for disclosure changes was carried out using the same methods as used for testing the factors affecting disclosure levels. GLS regressions adjusted for autocorrelation were used to individually regress each of the three main disclosure dimensions against the explanatory variables. Second, a multivariate GLM regression approach was used so that the covariance matrix would reflect the correlations of the disclosure dimensions with each other. Multicollinearity condition indices were below four in all cases, indicating low multicollinearity (Jobson, 1991) and White's test statistic for heteroskedasticity (White, 1980) was not significant for any of the models.

Hypotheses H4-H8

Table Eight shows the estimated coefficients resulting from the GLS regressions adjusted for autocorrelation, while Table Nine shows the estimated coefficients resulting from the multivariate GLM regression[1]. As with the disclosure level models, results vary slightly depending on whether returns or earnings news proxies are used.

---

[1] Inclusion of the year to year change in R&D expense as a control variable had no effect upon the significance or sign of the other variables in the model, and was not itself significant in explaining disclosure changes.

Support for Hypothesis H4 requires that the coefficient on PNEWS be significant and negative. Tables Eight and Nine show that typically this coefficient is not significant or is actually positive and significant, primarily when market-based news proxies are used. These results suggest that prior period performance news is not related to changes in the volume of disclosure, and is positively rather than negatively associated with changes in disclosure quantitativeness and the provision of forward looking information.

Hypothesis H5 asserts that current performance news is positively associated with changes in disclosure. Examination of the coefficient on CNEWS in Tables Eight and Nine shows that current news is positively associated with disclosure timing changes when earnings news proxies are used, and with disclosure content changes when market based proxies are used. However, current performance news is not significantly associated with changes in disclosure presentation, and returns-based news proxies are negatively associated with changes in disclosure timing.

Support of Hypothesis H6 requires that the coefficient on either or both of the proxies for industry performance (INDPERFE and INDPERFR) be positive. For the disclosure content and presentation change dimensions, this coefficient is not significant, while for the disclosure timing change dimension when market based news proxies are used the coefficient is weakly significant and positive. It thus appears that industry performance has little relation to changes in disclosure volume or quantitativeness, but is associated with the provision of forward looking information when market returns are the measure of news.

Support of Hypothesis H7 requires that the coefficient on FNEWS be positive. The coefficient is not significant in the disclosure presentation or timing changes model, but is significant and negative for the disclosure content model when market based news proxies are used. This means that future good news (in the form of market returns) tends to reduce the amount of disclosure in the current year relative to the previous year, while future bad news tends to increase the amount of disclosure in the current year. However, future news

does not appear to be associated with changes in quantitativeness or the provision of forward looking information.

Hypothesis H8 asserts that the change from bad news in the past or present period to good news in the current or following period is positively associated with disclosure changes. The coefficient on the dummy variable NEWSCHANGE should be positive and significant if this hypothesis is true. However, on none of the models is this coefficient significant, so there is no evidence to support this relationship. Similarly, Hypothesis H9 requires that the coefficient on the interaction of DSIZE and CNEWS be negative. While this coefficient is negative for most of the models, it is not significant. The coefficient on this interaction term is significant for one of the disclosure presentation change measures when earnings news proxies are used , but in this case it is positive. There is thus no support for this hypothesis.

7.2.3 Hypotheses Related to Causal Attributions

Hypothesis H10a and H10b required an examination of the relative proportions of internal versus external attributions categorized as to whether the outcome was bad or good. Testing of these hypotheses is equivalent to checking whether the proportion is significantly less or greater than .5, which by subtracting .5 from each of the sample proportions is equivalent to comparison of whether the sample mean is significantly greater or less than 0, respectively for H10a and H10b. Both hypotheses were supported. The transformed mean of INTERP-N had a value of .215, with a t-statistic of 3.097 (p= .004) , while the transformed mean of INTERP-P had a value of-.323, with a t-statistic of –9.82 (p= .0001).

7.2.4 Alternative Approaches and Research Question

A rank regression approach (Iman and Conover, 1979) adjusted for autocorrelation was also used to test the hypotheses H3 to H9 using the univariate models. This approach requires ranking of the dependent and independent variables and then performing the

desired regressions using the transformed data. As noted in Lang and Lundholm (1992), "... if the relation between the dependent variable and the independent variables is monotonic, a higher-ranked independent variable will correspond to a higher-ranked dependent variable, regardless of the precise nature between the two variables." Since the theory underlying the model requires only that such a monotonic relationship exist, a test of this approach seemed appropriate, and would also remove the effects of any minor measurement error in the data as well as reduce the effect of major outliers

The results of the rank regression for the disclosure levels models were very similar to that obtained without rank transforming the data. The coefficients of the models using earnings proxies showed little change in significance, except that the DSIZE variable in the TIMING2-L model was no longer significant, while the INDPERFE coefficient for the PRESENT2-L model became significant. The FNEWSR coefficient in the disclosure level models using returns news proxies became insignificant, while the SIZE*ANLYST interaction in the PRESENT1-L model became significant.

The results of the rank regression for the disclosure changes models showed a number of differences from the one performed without transforming the data. For the models using earnings news proxies, The CNEWSE coefficient in the CONTENT1-C model became significant, as did the INDPERFE coefficient in the PRESENT1-C model. The CEXTFIN coefficient in the PRESENT1-C model also became significant. However, the coefficient on the DSIZE*CNEWSE interaction in the PRESENT2-C model was no longer significant. For the models using market returns news proxies, most of the coefficients which had been significant became non-significant, although the INDPERFR coefficient became significant for the CONTENT1-C and the two PRESENT-C models.

An outlier analysis was also performed to determine whether any of the disclosure levels or changes models' coefficients would significantly change if influential observations were removed. An examination of the PRESS statistic for the disclosure level models showed that in most cases the statistic was less than one, indicating low sensitivity of the model fit to

the omission of particular observations (Jobson, 1991), with the largest value being 3.6. The PRESS statistics for the disclosure changes models varied between .91 and 56, with several models having PRESS statistics of over 6, suggesting a much larger problem with outliers. An iterative procedure involving removal of observations which had relatively large values of Cook's D (Cook and Weisburg, 1982) and DFFITS (Belsey, Kuh, and Welsch, 1980) and rerunning of the regressions was performed to minimize the Press statistic while at the same time trying to maintain sample size as much as possible. However, even after removal of a number of outliers, the Press statistic still had values in excess of 13 for the disclosure changes model for the TIMING1-C and PRESENT1-C models using market news proxies and for the PRESENT1-C model using earnings news proxies. This result suggests a general lack of fit problem for these change models.

After outlier removal, the significance of the coefficients for the disclosure changes models remained largely unaffected, as did the coefficients for the disclosure changes model using earnings news proxies. However, the coefficients for the disclosure change model using market based news proxies did change, with the coefficients on current news tending to become non-significant for the CONTENT and TIMING models and significant for the PRESENT model. The coefficient on the INDPERFR variable tended to become significant for all three disclosure change dimensions, the NEWSCHANGE-R coefficient became significant for the TIMING and PRESENT change models, but the DSIZE variable became insignificant for the CONTENT model. These results generally suggest some instability in the coefficients on the disclosure change model using market based news proxies.

Considered together, the results of the rank transformation and outlier analysis suggest greater coefficient stability for the models using earnings news based proxies, and for the disclosure level models. The disclosure changes model using market returns news proxies seems to generally have unstable coefficients, although whether this is because of errors in measurement of the variables or a lack of model fit is not clear.

An analysis of whether a change in CEO significantly affected disclosure changes was also performed. The sample had only nine cases where the CEO had changed from the previous year. Inclusions of this information in the disclosure change regressions in the form of a dummy variable results in no improvement in model fit, and the coefficient upon the dummy variable was not significant.

7.3 General Discussion

Results of the hypothesis testing suggest that there is some support for the disclosure level hypotheses, but little for the disclosure change hypotheses. The disclosure level models' fit as indicated by the R^2 value is generally good, with values of R^2 typically between .20 and .50. Most of the structural variables expected to affect disclosure levels, such as company size, analyst following, and cross-listing did have a significant effect in the expected direction. In addition, the expected interaction between company size and analyst following was also found to be significant and in the expected direction.

There is some evidence that the explanatory variables also affect the disclosure level dimensions differently. For example, the volume of disclosure and disclosure of forward looking information is strongly positively associated with the company being cross-listed on a U.S. exchange, but the association between cross-listing and the provision of more quantitative information seems slightly weaker. Company size and analyst following also seem to be positively associated with the volume of information provided and the amount of quantitative information provided, but seem to have little effect on the provision of forward looking information. Future news appears to be related to the level of disclosure volume and the provision of forward looking information when market news proxies are used, but is not related to the provision of more quantitative information.

The causal attribution hypotheses were both supported by the data, although it should be noted that the majority of companies did not make any causal attributions in their "Letters to Shareholders" portion of the annual report, as noted earlier.

The hypothesis testing of the disclosure changes model typically yielded either little or no support for the model. The best model fit was for the disclosure content changes and market returns model, which had significant effects for company size, current news, and future news. The signs on the coefficients suggest that larger companies have less change in disclosure volume, and that current news is positively related to changes in disclosure volume. However, contrary to expectations, changes in future returns news appears to be negatively associated with changes in current disclosure. Past returns news seems to be positively related to changes in the provision of forward looking disclosures and disclosure quantitativeness, but not to changes in volume of disclosure.

The reasons for these discrepancies do not appear to be related to a lack of change in disclosure or because the changes are monotonic. The descriptive information given in Table Three Panel B does indicate that disclosure changes do occur across all dimensions. The values shown in Panel B for the raw disclosure changes are for absolute changes; when the change directions are signed the median change value is 1 for disclosure content and 0 for the other two dimensions, suggesting that disclosure changes do occur equally in both directions.

There are several possible causes for the lack of expected findings regarding disclosure changes, and in particular for the tendency towards a lack of significance of surrounding earnings or returns news in explaining disclosure levels or changes:

1. Probably the most likely cause is the ability of companies to provide differential levels of information across product lines. Companies can provide isolated fragments of information for various products such as market share for one product, product prices changes for another product, sales information for yet another product, etc. Thus, even when earnings are bad, companies can choose to provide information about the positive aspects of their operations as an impression management tactic. Similarly, when earnings news is good, companies can provide isolated items of information about different products to reduce proprietary costs. Since the coding method simply required

the first instance of any given disclosure to be coded in keeping with the coding done in other work like Botosan (1997), the coding scores are not sensitive to differences in the amount of information provided relative to the company's product lines.[1]

2. Companies may also differ as to what variables best capture what constitutes good or bad news. For example, companies in the "start-up" phase of the business cycle may be focused on gaining sales and/or increasing share price, depending on their need for capital. Because operations are new, there is little expectation of profitability for the company, and instead the emphasis will be on the company's growth. More mature companies may be evaluated on either earnings or share prices. Companies that are expected to need significant additional capital may be most concerned with share price, while companies not needing public equity or debt may be concerned primarily with changes in earnings. A recent paper by Degeorge, Patel, and Zeckhauser (1999) on the thresholds that seem most related to earnings management behavior find that the need to report positive profits dominates sustaining past performance or meeting analyst expectations as a motivator for earnings management. It may be that a similar issue occurs here for some companies, although testing of the effects of the sign of earnings news on disclosure behavior showed no significant results. In general, it may be that determination of what triggers accountability pressure and the need for impression management requires more careful study which takes into account factors such as the age of the company and the adequacy of its financing, and explores other possible means of measuring good versus bad news. The relative importance of changes in returns over changes in earnings in explaining disclosure changes may be related to the predominance of newer companies in the sample. Such companies may be more concerned about the need to raise public equity since they have fewer resources of their own to draw upon.

---

[1] The disclosure coding did include a weighting category in an attempt to capture the idea that companies could provide a particular disclosure item for a minority or majority of their operations, but the reliability of this weight factor was low so the weight was not used in constructing the disclosure scores.

3. There may have been sufficient coding error to mask or distort the actual changes in disclosure. However, if coding reliability were the cause of the problem, such errors should have had more effect on coding across companies than coding within companies, given how the coding was performed. Each company's annual reports were coded in sequence, and differences in coding led to reexamination of the preceding year's annual report to ensure that the coding change represented a real change in the underlying disclosure, rather than the result of missing a particular disclosure or coding the same thing differently. Since companies tend to have similar annual report formats from year to year, it is easier to code the annual reports for one company consistently than to code annual reports from different companies consistently.
4. The failure to find significant relations especially between earnings changes and disclosure changes may be due to difficulties in capturing the right earnings numbers for comparisons, which leads to increased standard errors and thus lack of significance for the earnings coefficients. The earnings numbers used were the original numbers adjusted for stock splits, rather than the restated numbers. It may be that it would be better to use restated numbers for past earnings news so as to better reflect the comparative information available at the time of the current earnings release. However, this would require collection of the restated numbers as they appeared the following year, and exclusion of any restatement effects after that point. The appropriate earnings number to use for the following year's news would likely be the original earnings number. Such a precise determination of the appropriate earnings numbers would be very difficult to capture from the ROB tapes, although hand collection from the annual reports might be possible.

CHAPTER 8
CONCLUSIONS

The intent of this study was to provide evidence concerning the factors that influence voluntary disclosures about intangible assets by firms for whom such assets are integral to financial performance. The study of narrative disclosures about intangible assets is justified because such assets are not well represented within the existing financial statements, and there is thus a need to better understand what level of voluntary information is provided about these items, and the factors that affect this level of disclosure. Differential provision of information depending on company performance could have important implications for stock prices and stakeholder information search costs, given the importance of information in setting security prices. The study also attempted to consider how factors differentially affected various disclosure dimensions, such as the volume of information provided, the provision of forward looking information, and the provision of quantitative versus qualitative information. The framework used to select factors of interest was based on accountability and impression management theory, which suggest that capturing information about the audience of the disclosures, the vulnerability of the company to accountability pressure, and the discrepancies between actual and desired behavior that lead to accountability pressure and the need for impression management would be key.

The study's findings reaffirm the importance of structural variables in determining overall disclosure levels. Company size is typically very significant and has a positive relation with disclosure levels, as does the existence of a cross-listing on a U.S. Exchange. While the former result has already been documented in a similar setting by Entwistle (1997), the latter result has not been previously illustrated for narrative disclosures. The results of the study also provide some evidence that seeking of public capital in the following year affects disclosure content levels when returns are used as the measure of news, in keeping with work such as Gibbins, Richardson and Waterhouse (1990) and

Ruland, Tung, and George (1990). However, the effects of public financing on disclosure changes is not significant, which provides some additional evidence for Frankel, McNichols and Wilson's (1995) suggestion that disclosures related to public financing are part of a long term policy rather than a short term strategy. Significant disclosure content differences by industry were also found when industry variables were the only explanatory variables used, but these differences became non-significant when other explanatory variables were added to the model. Analyst following is also found to have a significant and positive relation with disclosure levels when included by itself and with company size as a dummy variable within the disclosure levels model. The interaction term between company size and analyst following also generally supports the hypothesis that larger companies' disclosure levels are less affected by analyst following.

The study provides very limited support for the hypothesized effects of the news of the surrounding period affecting disclosure changes. Changes in current earnings news are significantly positively related to changes in the provision of the forward looking information, while changes in current market returns do have a significant and positive relation with changes in disclosure content, as predicted. However, changes in past returns news are positively and significantly related to some of the disclosure change dimensions, while changes in future returns are negatively related to changes in disclosure content. Both of these latter results have a sign opposite to what was predicted.

The study replicates previous causal attribution research (albeit in a different context) that finds that companies are more likely to take credit for good news and blame external forces for bad news. The number of companies making positive outcome attributions is nearly twice that of companies making negative outcome attributions. Aerts (1994) suggests that for firms with variable financial performance defensive tactics for bad news are less acceptable because repeated attempts to rationalize events that keep occurring are ineffective. The evidence in this study provides some support for Aerts' conclusion if one

accepts the commonly stated view that "high tech" firms have greater variability in their financial performance, and thus are less financially stable than non "high tech" firms.

The study does provide evidence that the explanatory factors differentially affect the level of various disclosure dimensions. The volume of disclosure and the provision of quantitative information are the dimensions most related to the explanatory variables, with a significant positive relation between these two dimensions and cross-listing, analyst following and size. The level of forward looking information provided is related to cross-listing, but not to the seeking of public financing or size. There is a significant positive relation between future returns news and the level of forward looking information, but not between future returns news and the other two disclosure level dimensions.

Disclosure changes also show some differential effects of the explanatory variables. Changes in the volume of disclosure are positively associated with large companies and current returns news, whereas changes in the provision of quantitative information seem to be positively related to the returns news of the preceding period. Changes in the provision of forward looking information are negatively associated with current news and positively associated with past news, but have no relation to future news. There is no clear explanation for this particular relationship.

In summary, the study contributes to the voluntary disclosure literature by:

1. Finding confirmatory evidence that narrative disclosures related to R&D are positively related to company size;
2. Providing evidence that Canadian firms that are cross-listed on U.S. exchanges do provide more voluntary disclosures than Canadian firms that are not cross-listed, in support of assertions made by analysts to the TSE taskforce studying corporate disclosure (Toronto Stock Exchange, 1995)
3. Providing additional support in a different context for the assertion made by Frankel et al (1995) that while voluntary disclosure may have a positive relation to the seeking of

public financing, this relation is part of a longer term strategy that affects disclosure levels, rather than a short term reaction that affects disclosure changes from year to year.

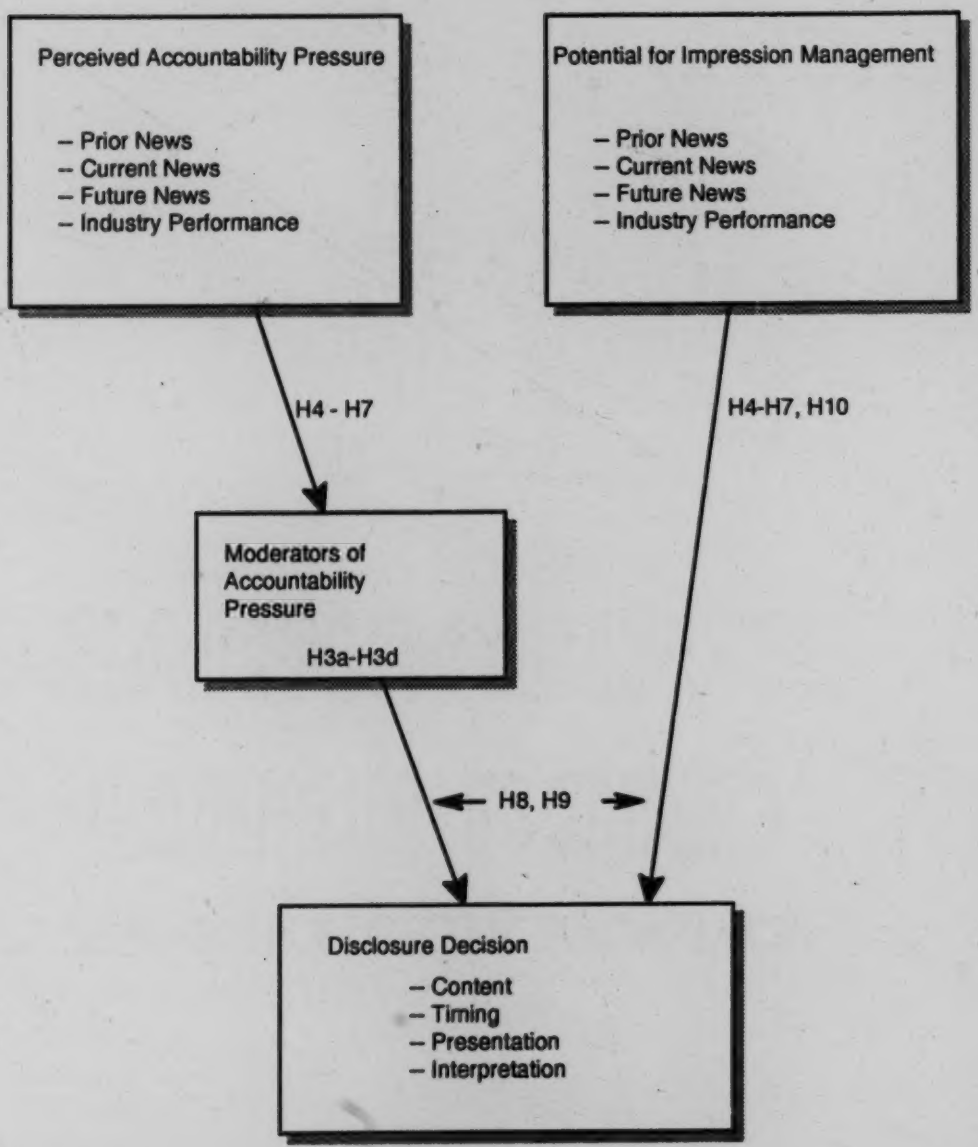
4. Providing evidence that larger companies' voluntary disclosures are less influenced by analyst following than are smaller companies' voluntary disclosures.
5. Showing that while disclosure dimensions are highly correlated, they are affected differently by the proposed explanatory factors. In particular, while the volume of disclosure and provision of quantitative information may be positively associated with company size and analyst following, the provision of quantitative information appears less influenced by cross-listing status, and the provision of forward looking information is influenced by cross listing status but not by company size or analyst following. Similarly, current returns news is positively associated with changes in the volume of disclosure, but negatively associated with changes in the provision of future-oriented information. Past returns news is positively associated with changes in quantitative and forward looking disclosure, but is not significantly associated with changes in disclosure content.

The study also contributes to the growing body of literature concerning intangible assets by providing further evidence that companies do provide some level of voluntary disclosure about these assets, but that the amount of disclosure is quite low compared to what analysts indicate they desire, if the disclosure index instrument represents even a conservative measure of what analysts would like to see disclosed.

The effectiveness of the accountability management/impression management framework as a theoretical basis for studying disclosure behavior is only partially supported by the study's results. While the variables predicted by the framework to affect disclosure levels seemed to generally have the expected effect, the framework's predictions for the variables affecting disclosure change are not generally well-founded. As discussed earlier, this may be because of measurement error as well as use of impression management tactics

that try to focus attention on the parts of the company that are doing well, even when overall company performance is poor. Opportunities for further research also exist in attempting to better define the financial performance variables that are associated with levels of and changes in disclosure. It appears possible that companies respond to different measures of performance, depending on their reliance on public financing and the stage of development the business is in. While some research has been done on financial performance factors that influence earnings management, much less has been done on the performance factors that are related to voluntary disclosure. Further investigation of this topic is required.

Figure One: Summary of Hypotheses [1]



[1] H1-H2 are not shown as they are a replication of previous research rather than resulting from the proposed disclosure framework.

Table One: Definitions of Dependent and Independent Variables

Panel A: Dependent Variables

Variable Name	Description	Measured As
CONTENT1-L_t	Number of current and future oriented items disclosed, as a proportion of the index maximum	$Currcont_t$+$Futcont_t$/(Indcurrmax+Indfutmax)
CONTENT2-L_t	Number of distinct items disclosed, as a proportion of the index maximum	$Dcont_t$/Inddismax
CONTENT1-C_t	Change in the number of current and future oriented items disclosed, as a proportion of the previous year's number of current and future items disclosed	($Ccurrcont_t$+$Cfutcont_t$)/ ($Currcont_{t-1}$+$Futcont_{t-1}$)
CONTENT2-C_t	Change in the number of distinct items disclosed, as a proportion of the previous year's number of distinct items disclosed	$Cdcont_t$/$Dcont_{t-1}$
TIMING1-L_t	Number of future-oriented items disclosed, as a proportion of the index maximum	$Futcont_t$/Indfutmax
TIMING2-L_t	Number of future oriented items disclosed, as a proportion of the number of distinct items disclosed	$Futcont_t$/$Dcont_t$
TIMING1-C_t	Change in the number of future oriented items disclosed, as a proportion of the previous year's number of future oriented items disclosed	$Cfutcont_t$/$Futcont_{t-1}$
TIMING2-C_t	Change in TIMING2-L between year t-1 and year t	FUTURE2-L_t – FUTURE2-L_{t-1}
PRESENT1-L_t	Number of present and future quantitative items disclosed, as a proportion of the index maximum	$Quantcont_t$/Indquantmax
PRESENT2-L_t	Number of distinct quantitative items disclosed, as a proportion of the number of distinct items disclosed	$Dquantcont_t$/$Dcont_t$

Table One: Definitions of Dependent and Independent Variables (Continued)

Panel A: Dependent Variables (Continued)

PRESENT1-C_t	Change in the number of current and future quantitative items disclosed, as a proportion of the previous year's number of current and future quantitative items disclosed	$Cquantcont_t/Quantcont_{t-1}$
PRESENT2-C_t	Change in PRESENT2-L between year t-1 and year t	PRESENT2-L_t - PRESENT2-L_{t-1}
INTERP-P_t	Number of external attributions as a proportion of all positive outcome attributions	$Extattr_t/Posattr_t$
INTERP-N_t	Number of external attributions as a proportion of all negative outcome attributions	$Extattr_t/Negattr_t$

Where:

$Currcont_t$= Number of current-oriented disclosure index items counted in the year t annual report

$Futcont_t$ = Number of future oriented disclosure index items counted in the year t annual report

$Dcont_t$ = Number of distinct disclosure index items counted in the year t annual report (a distinct disclosure index item is counted once, even if disclosed in both current and future oriented form)

$Quantcont_t$= Number of current and future quantitative disclosure index items counted in the year t annual report

$Dquantcont_t$= Number of distinct quantitative disclosure index items counted in the year t annual report (a distinct disclosure index item is counted once, even if disclosed in both current and future oriented form)

$Ccurrcont_t$ = $Currcont_t - Currcont_{t-1}$

$Cfutcont_t$ = $Futcont_t - Futcont_{t-1}$

$Cquantcont_t$ = $Quantcont_t$-$Quantcont_{t-1}$

$Cdcont_t$ = $Dcont_t$-$Dcont_{t-1}$

Indcurrmax = Maximum number of current oriented disclosure items contained in the index, with a value of 36

Indfutmax = Maximum number of future oriented disclosure items contained in the index, with a value of 33

Inddismax = Maximum number of distinct disclosure items contained in the index, with a value of 41.

Indquantmax = maximum number of quantitative disclosure items contained in the index, with a value of 60.

$Extattr_t$= Number of causal attributions in the year t annual report "letter to shareholders" where the cause was given as external to the organization

$Posattr_t$= Number of causal attributions in the year t annual report "letter to shareholders" where the outcome was positive from the company's perspective

$Negattr_t$= Number of causal attributions in the year t annual report "letter to shareholders" where the outcome was negative from the company's perspective

Table One: Definitions of Dependent and Independent Variables (Continued)

Panel B: Independent Variables

Variable Name	Description	Measured As
INDUST	Company's industry	A categorical variable representing the two digit SIC code of company as stated in Compact Disclosure.
CROSS-LIST$_t$	Whether company was cross-listed on a U.S. stock exchange	Coded as 1 if cross-listed and 0 otherwise, based on annual report information
LANLYST$_t$	Number of analysts following the company	Log of (the number of analysts following the company +1) based on information given in *Nelson's Directory of Investment Research*
EXTFIN$_t$	External financing of bonds or equity acquired in year t+1	Coded as 1 if external financing was acquired in year t+1 and 0 otherwise, as reported in the annual report
CEXTFIN$_t$	Indicates a change in the acquiring of external financing between year t and year t+1. External financing acquired in year t will tend to bias the disclosure change downwards, while external financing acquired in year t+1 will tend to bias the disclosure change upwards	An ordinal variable, coded as 0 if external financing was acquired both years or neither year; as –1 if external financing was acquired in year t but not year t+1; and as 1 if external financing was acquired in year t+1 but not year t
SIZE$_t$	Size of the company	The square root of (total assets/10,000,000), as reported by ROB
DSIZE$_t$	Indicates if company is large or small	Dummy variable with a value of 1 if SIZE$_t$ is greater than the median value and 0 otherwise
CNEWSE$_t$, FNEWSE$_t$, PNEWSE$_t$	News as measured by earnings scaled by price on the first day of trading for the current period, future period and past period respectively	EPS_t-EPS_{t-1}/Pr_t EPS_{t+1}-EPS_t/Pr_{t+1} EPS_{t-1}-EPS_{t-2}/Pr_{t-1}
CNEWSR$_t$, FNEWSR$_t$, PNEWSR$_t$	News as measured by abnormal returns over the period between successive earnings announcements	REA_t-$MkREA_t$ REA_{t+1}-$MkREA_{t+1}$ REA_{t-1}-$MkREA_{t-1}$
NEWSCHANGE-E	Indicates a change from bad to good earnings news	Dummy variable with a value of 1 if (CNEWSE > 0 and PNEWSE < 0) or (FNEWSE > 0 and CNEWSE < 0) and 0 otherwise
NEWSCHANGE-E	Indicates a change from bad to good returns news	Dummy variable with a value of 1 if (CNEWSE > 0 and PNEWSE < 0) or (FNEWSE > 0 and CNEWSE < 0) and 0 otherwise

Table One: Definitions of Dependent and Independent Variables (Continued)

Panel B: Independent Variables

$INDPERFE_t$	Relative Industry Performance based on 2 digit SIC industry classifications and using the median value of earnings scaled by opening price for the period for companies in the industry same industry, excluding company i's own earnings.	$Median((EPS_t-EPS_{t-1})/Pr_t)$ for all companies in the same 2 digit SIC whose fiscal year ended in the same month or the preceding 11 months as company i, excluding company i's own value
$INDPERFR_t$	Relative Industry Performance based on 2 digit SIC industry classifications and using the median value of the abnormal returns for companies in the same industry with returns available for the same period as company i, excluding company i's own abnormal returns	$Median(REA_t-MkREA_{t-1t})$ for all companies in the same 2 digit SIC with returns available for the same period as used for company i, excluding company i's own abnormal returns.

Where:

EPS_t = Basic earnings per share at time t before extraordinary items

Pr_t = Closing stock price on the first day of trading of fiscal year t

REA_t = Cumulative returns over period t, starting at day d+3 for year t-1, where d is the annual earnings announcement date and ending at day d+2 for year t

MkREA = Cumulative market returns over period t, starting at day d+3 for year t-1, where d is the annual earnings announcement date, and ending at day d+2 for year t

Table Two: Sample Versus Industry Descriptive Statistics

SIC Grouping	Yr	# obs in sample (industry figure beneath)	Average assets in sample in 000's (industry figure beneath)	Average Basic EPS Before Extraordinary Items in sample (industry figure beneath)	Average R&D Expense in sample in 000's (industry figure beneath)
28 (INDUST=1) (pharmaceuticals/ biotechnology)	92	2 20	80,583 24,698	-.44 -.26	14, 825 3,624
	93	3 22	72,301 26,379	-.51 -.21	8,662 3,890
	94	3 27	72,184 24,311	-.31 -.27	12,160 4,158
	95	2 31	169,158 29,961	-.44 -.24	18,964 4,298
	96	0 30	0 49,356	0 -.43	0 5,786
35 (INDUST=2) (non-electronic equipment)	92	7 12	110,816 74,942	-.24 .38	2,852 1,960
	93	7 13	124,785 84,956	-.62 -.29	2,834 2,015
	94	10 13	106,985 92,405	.21 .32	2,624 2,559
	95	7 12	118,116 112,492	.41 .43	6,103 4,395
	96	3 14	139,971 122,413	.61 .61	4,653 7,127
36 (INDUST=3) (electronic equipment)	92	10 26	222,052 114,778	-.01 .25	6,281 3,739
	93	13 27	217,165 137,405	.40 .36	5,298 4,390
	94	12 35	277,088 129,545	.63 .34	6,591 5,003
	95	13 36	303,902 146,699	.56 .54	8,900 5,799
	96	7 35	243,648 178,392	.61 .38	1,883 7,885
73 (INDUST=4) (software)	92	6 17	39,745 23,922	-.47 .03	4,359 2,274
	93	8 22	37,313 32,260	-.11 .21	6,054 3,376
	94	11 26	44,062 45,546	.41 .19	4,633 3,673
	95	11 28	64,941 77,637	.43 .24	5,779 4,280
	96	5 31	98,583 51,993	.32 .06	10,851 5,523

Table Three: Descriptive Statistics

Panel A: Disclosure Level Measures and Variables

Variable	N	Mean	Median	Standard Deviation
Number of distinct disclosures	140	15.50	16	4.520
Number of future oriented disclosures	140	3.014	3	2.437
Number of distinct quantitative disclosures	140	6.671	7	2.862
Number of quantitative disclosures - future	140	.5214	0	.7631
INTERP-N_t*	33	.7151	1	.3989
INTERP-P_t*	69	.1768	0	.2732
CONTENT1-L_t	140	.2456	.2463	.0817
CONTENT2-L_t	140	.3780	.3902	.1103
TIMING1-L_t	140	.0913	.0909	.0738
TIMING2-L_t	140	.1890	.1889	.1363
PRESENT1-L_t	140	.1165	.1167	.0512
PRESENT2-L_t	140	.4197	.4142	.1324
$LANLYST_t$	140	.6546	.7386	.4368
$SIZE_t$	140	2.951	2.113	2.538
$CNEWSE_t$,	117	.2422	.0056	1.959
$FNEWSE_t$,	124	.0546	.0058	.3064
$PNEWSE_t$	111	.5712	.0056	3.251
$CNEWSR_t$,	139	.4709	.0473	1.703
$FNEWSR_t$,	139	.2065	-.0541	1.209
$PNEWSR_t$	128	.5653	.0907	1.733
$INDPERFE_t$	137	.0432	.0095	.1678
$INDPERFR_t$	139	.0698	-.0064	.3267
$EXTFIN_t$	140	.143**	N/A	N/A
CROSS-$LIST_t$	140	.3710**	N/A	N/A

*Values of N reported for INTERP-N and INTERP-P are the number of firms who made causal attributions of the 140 firms in the sample.

** The variables EXTFIN and CROSS-LIST are dummy variables, so the median and standard variance measures are not relevant.

Table Three: Descriptive Statistics (Continued)

Panel B: Disclosure Changes Measures and Variables

Variable	N	Mean	Median	Standard Deviation
Absolute change in number of distinct disclosures	100	2.46	2	3.009
Absolute change in number of distinct quantitative disclosures	100	1.32	1	1.859
Absolute change in the number of future oriented disclosures	100	1.3	1	1.860
CONTENT1-C_t	100	.1037	.0697	.3018
CONTENT2-C_t	100	.0853	.0557	.2569
TIMING1-C_t	87	.1703	0	.7580
TIMING2-C_t	100	.0147	0	.1283
PRESENT1-C_t	99	.1251	0	.4413
PRESENT2-C_t	100	.0036	0	.0984
$CNEWSE_t$, $FNEWSE_t$, $PNEWSE_t$	90 90 86	.0761 .0288 .346	.007 .0064 .0064	.349 .2447 2.279
$CNEWSR_t$, $FNEWSR_t$, $PNEWSR_t$	100 99 100	.3630 .1752 .5494	.0442 -.0561 .0414	1.323 1.899 1.248
NEWSCHANGE-E*	100	.42	N/A	N/A
NEWSCHANGE-R*	100	.54	N/A	N/A
$INDPERFE_t$	100	.0384	.0096	.1579
$INDPERFR_t$	100	.0296	-.0201	.3334
CEXTFIN	100	-.01	0	.3891

* The variables NEWCHANGE-E, and NEWSCHANGE-R are dummy variables, so the median and standard variance measures are not relevant.

Table Four: Correlations (Continued)

Panel B: Disclosure Change Variables

Variable	CONTENT1-C	TIMING1-C	PRESENT1-C	DSIZE	CEXTFIN	CNEWSE	FNEWSE	PNEWSE	CNEWSR	FNEWSR	PNEWSR	NEWSCHANGE-E	NEWSCHANE-R	INDPERFE	INDPERR
CONTENT1-C	1.00	.519 ****	.560 ****	-.089	-.059	.210**	-.189*	-.072	.055	-.138	-.016	-.016	.007	-.211 **	.135
TIMING1-C	.412 ****	1.00	.414 ****	-.077	.017	.148	.038	-.194*	-.059	.008	.056	.044	.043	-.038	.070
PRESENT1-C	.513 ****	.376 ****	1.00	.090	.065	.078	-.021	.026	.061	-.130	-.042	-.025	.097	-.042	.249 ***
DSIZE	-.151	-.083	-.001	1.00	.025	.089	.188*	.150	.121	.197*	.093	-.041	.080	-.050	-.039
CEXTFIN	.046	.035	.120	.026	1.00	.049	-.003	-.190*	.229 **	-.004	-.190*	.075	.127	-.058	.100
CNEWSE	.087	.081	-.003	-.016	.067	1.00	-.072	-.234 **	.403 ****	.169	.037	-.033	.102	-.108	.019
FNEWSE	-.053	-.059	-.072	.208**	-.015	-.101	1.00	-.121	.078	.406 ****	.013	.482 ****	.116	.042	.062
PNEWSE	.125	-.058	.020	.087	-.004	.234**	.307 ***	1.00	-.100	-.026	.427 ****	-.556 ****	-.206 *	-.077	-.083
CNEWSR	.170*	-.115	.112	-.058	.095	.207**	-.119	-.075	1.00	-.046	-.019	.075	.053	-.058	.284 ***
FNEWSR	-.209 **	-.035	-.138	-.004	-.038	.023	.251**	.039	-.112	1.00	.072	.083	.293	.061	-.001
PNEWSR	.083	.152	.228**	-.097	-.022	.172*	-.104	-.017	-.057	.081	1.00	-.186*	-.481	.061	-.001
NEWSCHANGE-E	-.011	.041	-.063	-.040	.074	.156	.239**	-.159	.082	.061	-.016	1.00	.028	.070	.195**
NEWSCHANGE-R	-.032	.018	-.011	.080	.127	.142	.159	.088	-.028	.148	-.168*	.028	1.00	-.017	.040
INDPERFE	-.143	-.001	.038	-.068	.001	-.018	.152	-.037	.004	.527 ****	.079	.171*	-.018	1.00	-.043
INDPERR	.126	.174	.178*	-.045	.046	.100	.094	.133	.225*	-.111	.191*	.191**	.047	.0005	1.00

Pearson correlations are on the lower diagonal; Spearman correlations are on the upper diagonal

**** Significant at the .1% level
*** Significant at the 1% level
** Significant at the 5% level
* Significant at the 10% level

Table Four: Correlations

Panel A: Disclosure Level Variables

Variable	CONTENT1-L	TIMING1-L	PRESENT1-L	LANLYST	SIZE	EXTFIN	CROSS_LIST	CNEWSE	FNEWSE	PNEWSE	CNEWSR	FNEWSR	PNEWSR	INDPERFE	INDPERFR
CONTENT1-L	1.00	.674 ****	.725 ****	.573 ****	.531 ****	.160*	.518 ****	.106	.041	-.102	.029	.042	-.075	-.087	-.113
TIMING1-L	.710 ****	1.00	.299 ****	.285 ****	.129	.064	.346 ****	.050	-.107	-.083	-.042	-.001	.015	-.046	-.058
PRESENT1-L	.698 ****	.234 ***	1.00	.489 ****	.542 ****	.179**	.292 ****	-.023	.168*	-.090	-.040	.061	-.129	-.044	-.123
LANLYST	.566 ****	.264 ****	.492 ****	1.00	.791 ****	.127	.387 ****	.045	.028	-.034	.009	.111	-.004	-.061	-.170 **
SIZE	.329 ****	-.019	.470 ****	.626 ****	1.00	.122	.206 ***	.103	.068	-.023	.014	.133	.048	-.085	-.098
EXTFIN	.207 ***	.149*	.202 ***	.123	.116	1.00	-.018	-.035	-.093	-.057	.008	.041	-.071	-.033	.139*
CROSS_LIST	.485 ****	.33 ****	.283 ***	.376 ****	.127	-.018	1.00	-.082	-.005	-.136	.001	-.049	.013	-.034	-.116
CNEWSE	-.135	-.077	-.06	-.192 **	-.033	.033	.067	1.00	-.148	-.167*	.393 ****	.102	.063	-.131	-.027
FNEWSE	-.067	-.109	.024	-.229 ***	-.046	.059	.080	.242 ***	1.00	.002	.015	.402 ****	-.026	-.065	.019
PNEWSE	-.158*	-.105	-.073	-.259 ****	-.060	-.042	-.073	.791 ****	.359 ****	1.00	.008	.009	.299 ****	-.124	-.096
CNEWSR	-.066	-.012	-.138	-.162*	-.114	.124	-.041	-.016	.179**	-.016	1.00	.015	.008	-.105	.250 ***
FNEWSR	-.078	.111	-.120	-.061	-.022	.084	.019	-.041	.242 ***	-.019	-.039	1.00	.008	-.033	-.157*
PNEWSR	-.070	.089	-.108	-.107	-.099	-.070	-.099	.030	-.102	-.006	-.043	.029	1.00	.040	.082
INDPERFE	-.114	-.033	-.139	-.059	-.091	.048	-.156*	-.027	.044	-.045	-.038	.297 ***	.082	1.00	-.017
INDPERFR	-.053	.049	-.117	-.14*	-.04	.144*	-.122	-.023	.048	.038	.121	-.058	.194**	.025	1.00

Pearson correlations are on the lower diagonal; Spearman correlations are on the upper diagonal

**** Significant at the .1% level

*** Significant at the 1% level

** Significant at the 5% level

* Significant at the 10% level

Table Five: Univariate Regressions Adjusted for Autocorrelation of Disclosure Content on Company Size and Industry Variables

		CONTENT1-L as dependent variable			CONTENT2-L as dependent variable		
Model/ Variable	Predicted Sign	Regression Coefficient	t-stat	R^2	Regression Coefficient	t-stat	R^2
Company Size Only Model:				.099			.131
Intercept	?	.211	15.3****		.327	17.2****	
SIZE	+	.012	3.85****		.018	4.52****	
Industry Variables Only Model:				.035			.062
Intercept	?	.315	9.48****		.500	11.1****	
ELECTRONIC	?	-.075	-2.14**		-.135	-2.88***	
NONELECTRONIC	?	-.075	-2.02**		-.121	-2.44**	
SOFTWARE	?	-.073	-2.05**		-.132	-2.80***	
Company Size and Industry Variables Model:				.141			.200
Intercept	?	.279	8.57****		.443	10.4****	
SIZE	+	.012	4.03****		.019	4.77****	
ELECTRONIC	?	-.082	-2.48		-.143	-3.34****	
NONELECTRONIC	?	-.076	-2.18**		-.120	-2.65***	
SOFTWARE	?	-.062	-1.87*		-.115	-2.66***	
N	135						

**** Significant at the .1% level
*** Significant at the 1% level
** Significant at the 5% level
* Significant at the 10% level

Table Six: Univariate Disclosure Level Regressions Adjusted for Autocorrelation

Panel A: Regression Models Using the Earnings Based News Proxies

		CONTENT1-L (CONTENT2-L)		TIMING1-L (TIMING2-L)		PRESENT1-L (PRESENT2-L)	
Variable	Predicted Sign	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat
INTERCEPT	?	.095 (.186)	2.77*** (4.26)****	.056 (.238)	1.35 (2.92)***	.050 (.352)	1.99** (5.16)****
ELECTRONIC	?	.046 (.039)	1.56 (1.01)	.005 (-.031)	.140 (-.437)	.010 (.009)	.455 (.138)
NONELECTRONIC	?	.018 (.016)	.030 (.421)	-.011 (-.039)	-.323 (-.542)	.001 (-.006)	.042 (-.097)
SOFTWARE	?	.041 .028)	1.35 (.725)	.019 (.009)	.515 (.124)	.009 (.003)	.397 (-.050)
CROSS-LIST	+	.086 (.108)	5.37**** (5.26) ****	.055 (.034)	2.87*** (.920)	.024 (.000)	2.08** (.008)
EXTFIN	+	.013 (-.010)	.701 (-.477)	.027 (.033)	1.04 (.662)	.004 (.024)	.343 (.641)
DSIZE	+	.153 (.224)	3.93**** (4.63)****	.010 (-.107)	.216 (-1.13)**	.097 (.282)	3.55**** (2.67)***
LANLYST	+	.114 (.177)	4.12**** (5.50)****	.013 (-.056)	.358 (-.793)	.064 (.007)	3.56**** (1.78)**
SIZE*LANLYST	-	-.148 -.219	-3.337*** -4.09****	-.008 (.108)	-.140 (.981)	-.082 (-.261)	-2.72*** (-2.03)**
CNEWSE	?	-.003 (-.005)	-.854 (-1.14)	-.001 (-.001)	-.113 (-.118)	.000 (.008)	.105 (1.18)
PNEWSE	?	-.003 (-.005)	-1.05 (-1.46)	-.001 (.002)	-.169 (.262)	-.002 (-.009)	-1.40 (-1.30)
FNEWSE	?	.005 (.011)	.273 (.562)	-.019 (-.054)	-.756 (-1.11)	.005 (.028)	.479 (.849)
INDPERFE	?	-.048 (-.073)	-1.36 (-1.92)*	-.001 (.130)	-.019 (1.34)	-.025 (-.036)	-1.23 (-.543)
R^2 N		.542 (.59) 103		.176 (.101) 103		.407 (.175) 103	

**** Significant at the .1% level (one-tailed test when the sign is predicted; two-tailed otherwise)
*** Significant at the 1% level (one-tailed test when the sign is predicted; two-tailed otherwise)
** Significant at the 5% level (one-tailed test when the sign is predicted; two-tailed otherwise)
* Significant at the 10% level (one-tailed test when the sign is predicted; two-tailed otherwise)

Table Six: Univariate Disclosure Level Regressions Adjusted for Autocorrelation (Continued)

Panel B: Regression Models Using the Market Returns Based News Proxies

		CONTENT1-L (CONTENT2-L)		TIMING1-L (TIMING2-L)		PRESENT1-L (PRESENT2-L)	
Variable	Predicted Sign	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat
INTERCEPT	?	.130 (.253)	4.01**** (5.83)***	.041 (.121)	1.17 (2.43)**	.087 (.392)	3.65**** (5.75)****
ELECTRONIC	?	.026 (.004)	.939 (.104)	.005 (-.017)	.177 (-.276)	-.011 (-.010)	-.512 (-.174)
NONELECTRONIC	?	.004 (-.010)	.176 (-.257)	-.006 (-.021)	-.200 (-.338)	-.016 (-.022)	-.778 (-.362)
SOFTWARE	?	.021 (-.002)	.745 (-.060)	.018 (.023)	.608 (.378)	-.013 (-.019)	-.680 (-.322)
CROSS-LIST	+	.066 (.074)	4.34**** (3.72)****	.049 (.046)	2.94*** (1.37)*	.011 (-.012)	1.08 (-.395)
EXTFIN	+	.026 (.022)	1.54* (1.03)	.023 (.018)	1.09 (.457)	.009 (.021)	.862 (.687)
DSIZE	+	.077 (.098)	2.28** (2.26)**	.002 (-.063)	.054 (-.846)	.043 (.143)	1.93** (2.17)**
LANLYST	+	.094 (.130)	3.42**** (3.73)***	.032 (.009)	1.03 (.157)	.042 (.032)	2.46*** (.612)
SIZE*LANLYST	-	-.065 (-.078)	-1.60* (-1.50)*	-.005 (.043)	-.112 (.475)	-.020 (-.085)	-.778 (-1.08)
CNEWSR	?	.001 (-.001)	.174 (-.102)	-.001 (-.005)	-.208 (-.657)	-.002 (-.010)	-1.08 (-1.68)*
PNEWSR	?	-.000 (.001)	-.133 (.204)	.003 (.011)	.819 (1.51)	-.002 (-.004)	-1.03 (-.719)
FNEWSR	?	-.002 (-.009)	-.377 (-1.64)*	.008 (.023)	1.44 (2.32)**	-.003 (-.004)	-1.30 (-.552)
INDPERFR	?	.003 (-.009)	.166 (-.44)	.013 (.031)	.657 (.83)	.002 (.004)	.298 (.152)
R^2 N		.451 (.478) 126		.188 (.139) 126		.342 (.147) 126	

**** Significant at the .1% level (one-tailed test when the sign is predicted; two-tailed otherwise)
*** Significant at the 1% level (one-tailed test when the sign is predicted; two-tailed otherwise)
** Significant at the 5% level (one-tailed test when the sign is predicted; two-tailed otherwise)
* Significant at the 10% level (one-tailed test when the sign is predicted; two-tailed otherwise)

Table Seven: Multivariate Disclosure Level Regressions

Panel A: Regression Models Using the Earnings Based News Proxies

		CONTENT1-L (CONTENT2-L)		TIMING1-L (TIMING2-L)		PRESENT1-L (PRESENT2-L)	
Variable	Predicted Sign	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat
INTERCEPT	?	.103 (.200)	3.34**** (5.28)****	.060 (.252)	1.49 (3.24)***	.056 (.305)	2.53** (4.60)*** *
ELECTRONIC	?	.042 (.028)	1.57 (.84)	.003 (-.037)	.10 (-.54)	.000 (.014)	.01 (.25)
NONELECTRONIC	?	.014 (.008)	.53 (.24)	-.013 (-.045)	-.37 (-.65)	-.015 (-.033)	-.81 (-.56)
SOFTWARE	?	.038 (.023)	1.36 (.67)	.017 (.002)	.47 (.03)	.006 (.011)	.29 (.18)
CROSS-LIST	+	.091 (.114)	6.43**** (6.57)****	.057 (.038)	3.05*** (1.05)	.027 (-.000)	2.68*** (-.01)
EXTFIN	+	.009 (-.001)	.48 (-.05)	.023 (.022)	.90 (.44)	.006 (.031)	.41 (.74)
DSIZE	+	.154 (.223)	4.30**** (5.06)****	.012 (-.106)	.25 (-1.16)	.105 (.239)	4.11**** (3.08)***
LANLYST	+	.106 (.158)	3.81**** (4.64)****	.010 (-.067)	.28 (-.96)	.065 (.130)	3.30**** (2.17)**
DSIZE*LANLYST	–	-.147 (-.212)	-3.49**** (-4.08)****	-.009 (.108)	-.16 (1.01)	-.090 (-.211)	-3.00*** (-2.31)***
CNEWSE	?	-.002 (-.003)	-.45 (-.50)	-.003 (-.001)	-.07 (-.08)	.000 (.006)	.13 (.63)
PNEWSE	?	-.005 (-.007)	-1.39 (-1.64)	-.001 (.001)	-.25 (.15)	-.004 (-.005)	.13 (-.74)
FNEWSE	?	.008 (.021)	.43 (.88)	-.021 (-.064)	-.84 (-1.30)	.019 (.063)	1.34 (1.50)
INDPERFE	?	-.054 (-.083)	-1.39 (-1.73)*	-.002 (.132)	-.05 (1.34)	-.045 (-.106)	-1.62 (-1.26)
R^2		.595 (.66)		.184 (.116)		.477 (.270)	
N		103		103		103	

**** Significant at the .1% level (one-tailed test when the sign is predicted; two-tailed otherwise)
*** Significant at the 1% level (one-tailed test when the sign is predicted; two-tailed otherwise)
** Significant at the 5% level (one-tailed test when the sign is predicted; two-tailed otherwise)
* Significant at the 10% level (one-tailed test when the sign is predicted; two-tailed otherwise)

Table Seven: Multivariate Disclosure Level Regressions (Continued)

Panel B: Regression Models Using the Market Returns Based News Proxies

		CONTENT1-L (CONTENT2-L)		TIMING1-L (TIMING2-L)		PRESENT1-L (PRESENT2-L)	
Variable	Predicted Sign	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat
INTERCEPT	?	.130 (.239)	4.60**** (6.58)****	.047 (.195)	1.42 (3.13)***	.084 (.373)	4.31**** (6.54)*** *
ELECTRONIC		.026 (.013)	1.10 (.44)	.002 (-.029)	.08 (-.54)	-.011 (-.007)	-.67 (-.15)
NONELECTRONIC		.010 (.007)	.40 (.21)	-.007 (-.026)	-.24 (-.49)	-.019 (-.041)	-1.13 (-.83)
SOFTWARE	?	.023 (.013)	.92 (.40)	.015 (.012)	.53 (.23)	-.007 (.011)	-.38 (-.22)
CROSS-LIST	+	.072 (.088)	5.35**** (5.05)****	.050 (.044)	3.21**** (1.48)*	.018 (-.012)	1.90** (-.43)
EXTFIN	+	.029 (.036)	1.63** (1.55)*	.019 (.000)	.88 (.00)	.022 (.055)	1.77** (1.51)*
DSIZE	+	.080 (.116)	2.58*** (2.89)***	-.001 (-.085)	-.04 (-1.23)	.056 (.186)	2.62*** (2.97)***
LANLYST	+	.090 (.127)	3.39**** (3.72)****	.028 (-.013)	.92 (-.22)	.041 (.064)	2.21*** (1.19)
DSIZE*LANLYST	–	-.072 (-.101)	-1.84** (-2.01)**	-.002 (.072)	-.04 (.83)	-.037 (-.145)	-1.39* (-1.84)***
CNEWSR	?	.0004 (.001)	.13 (.21)	-.001 (-.006)	-.26 (-.79)	-.002 (-.008)	-.78 (-1.18)
PNEWSR	?	-.001 (-.001)	-.18 (-.13)	.003 (.011)	.75 (1.42)	-.001 (-.001)	-.44 (-.17)
FNEWSR	?	-.002 (-.009)	-.38 (-1.47)	.007 (.021)	1.35 (2.10)**	-.004 (-.005)	-1.29 (-.52)
INDPERFR	?	.001 (-.016)	0.04 (-.71)	.016 (.044)	.76 (1.12)	-.013 (-.040)	-1.01 (-1.12)
R^2		.506 (.549)		.198 (.144)		.395 (.204)	
N		126		126		126	

**** Significant at the .1% level (one-tailed test when the sign is predicted; two-tailed otherwise)
*** Significant at the 1% level (one-tailed test when the sign is predicted; two-tailed otherwise)
** Significant at the 5% level (one-tailed test when the sign is predicted; two-tailed otherwise)
* Significant at the 10% level (one-tailed test when the sign is predicted; two-tailed otherwise)

Table Eight: Univariate Disclosure Change Regressions Adjusted for Autocorrelation

Panel A: Regression Models Using the Earnings Based News Proxies

		CONTENT1-C (CONTENT2-C)		TIMING1-C (TIMING2-C)		PRESENT1-C (PRESENT2-C)	
Variable	Predicted Sign	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat
INTERCEPT	?	.188 (.142)	3.30*** (2.98)***	.087 (.034)	.546 (1.31)	.192 (-.004)	1.850* (-.210)
CEXTFIN	+	.029 (.019)	.314 (.236)	.120 (.007)	.504 (.147)	.125 (.039)	.891 (1.22)
NEWSCHANGE-E	+	.035 (-.044)	.595 (-.826)	.030 (-.029)	.159 (-.911)	-.068 (-.002)	-.560 (-.058)
DSIZE	?	-.165 (-.132)	-2.60** (-2.49)**	-.018 (-.021)	-.104 (-.739)	-.079 (.018)	-.680 (.743)
DSIZE*CNEWSE	-	-.139 (-.091)	-.690 (-.544)	-.596 (-.070)	-1.17 (-.748)	.121 (.123)	.386 (1.73)**
CNEWSE	+	.097 (.035)	.719 (.312)	.559 (.078)	1.48* (1.27)*	-.053 (-.046)	-.247 (-.962)
PNEWSE	-	.025 (.022)	1.463 (1.56)	-.010 (-.004)	-.249 (-.567)	.001 (-.008)	.040 (-1.24)
FNEWSE	+	-.024 (-.009)	-.166 (-.077)	-.033 (.010)	-.093 (.165)	-.031 (-.017)	-.125 (-.322)
INDPERFE	+	-.231 (-.191)	-1.14 (-1.132)	-.094 (.044)	-.194 (.476)	-.036 (.071)	-.111 (.957)
R^2 N		.157 (.144) 82		.05 (.047) 71 (82)		.027 (.108) 81	

**** Significant at the .1% level (one-tailed test when the sign is predicted; two-tailed otherwise)
*** Significant at the 1% level (one-tailed test when the sign is predicted; two-tailed otherwise)
** Significant at the 5% level (one-tailed test when the sign is predicted; two-tailed otherwise)
* Significant at the 10% level (one-tailed test when the sign is predicted; two-tailed otherwise)\

Table Eight: Univariate Disclosure Level Regressions Adjusted for Autocorrelation (Continued)

Panel B: Regression Models Using the Market Returns Based News Proxies

		CONTENT1-C (CONTENT2-C)		TIMING1-C (TIMING2-C)		PRESENT1-C (PRESENT2-C)	
Variable	Predicted Sign	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat
INTERCEPT	?	.157 (.125)	3.31**** (3.17)***	.189 (.021)	1.146 (.978)	.078 (-.007)	.935 (-.396)
CEXTFIN	+	.054 (.048)	.718 (.770)	.112 (.023)	.516 (.694)	.117 (.046)	1.02 (1.77)**
NEWSCHANGE-R	+	-.015 (-.010)	-.275 (-.216)	.044 (.007)	.254 (.267)	.018 (-.009)	.197 (-.456)
DSIZE	?	-.106 (-.083)	-1.99** (-1.94)*	-.067 (-.024)	-.358 (-.956)	.008 (.026)	.089 (1.29)
DSIZE*CNEWSR	-	-.026 (-.031)	-.476 (-.697)	-.021 (.025)	-.136 (1.004)	-.063 (-.010)	-.729 (-.557)
CNEWSR	+	.038 (.043)	1.56* (2.13)**	-.092 (-.029)	-1.28 (-2.76)***	.038 (-.006)	.994 (-.755)
PNEWSR	-	.010 (.003)	.634 (.194)	.041 (.014)	.912 (2.06)**	.054 (.008)	2.17** (1.50)*
FNEWSR	+	-.050 (-.041)	-2.16** (-2.151)**	-.034 (.009)	-.521 (.953)	-.044 (.002)	-1.201 (.193)
INDPERFR	+	.064 (.026)	.694 (.341)	.388 (.040)	1.511* (1.01)	.136 (.040)	.970 (1.26)
R^2 N		.153 (.159) 98		.080 (.155) 86 (97)		.114 (.105) 98	

**** Significant at the .1% level (one-tailed test when the sign is predicted; two-tailed otherwise)
*** Significant at the 1% level (one-tailed test when the sign is predicted; two-tailed otherwise)
** Significant at the 5% level (one-tailed test when the sign is predicted; two-tailed otherwise)
* Significant at the 10% level (one-tailed test when the sign is predicted; two-tailed otherwise)

Table Nine: Multivariate Disclosure Changes Regressions

Panel A: Regression Models Using the Earnings Based News Proxies

		CONTENT1-L (CONTENT2-L)		TIMING1-L (TIMING2-L)		PRESENT1-L (PRESENT2-L)	
Variable	Predicted Sign	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat
INTERCEPT	?	.187 (.146)	2.90*** (2.73)***	.071 (.028)	.44 (.97)	.192 (-.006)	1.92* (-.25)
CEXTFIN	+	.029 (.015)	.31 (.19)	.148 (.022)	.63 (.50)	.124 (.040)	.86 (1.24)
NEWSCHANGE-E	+	.005 (.025)	.07 (.40)	.046 (-.021)	.24 (-.58)	-.073 (.000)	-.60 (.01)
DSIZE	?	-.159 (-.133)	-2.20** (-2.22)**	-.018 (-.020)	-.10 (-.58)	-.076 (.018)	-.68 (.74)
DSIZE*CNEWSE	-	-.149 (-.103)	-.73 (-.61)	-.570 (-.035)	-1.13 (-.37)	.136 (.119)	.43 (1.71)**
CNEWSE	+	.103 (.044)	.73 (.38)	.552 (.043)	1.47* (.66)	-.066 (-.043)	-.30 (-.90)
PNEWSE	-	.023 (.018)	1.29* (1.25)	-.007 (-.003)	-.18 (-.32)	.001 (-.007)	.05 (-1.20)
FNEWSE	+	-.012 (.002)	-.07 (.02	-.019 (.022)	-.05 (.30)	-.053 (-.017)	-.22 (-.32)
INDPERFE	+	-.323 (-.291)	-1.52 (-1.66)*	-.133 (.065)	-.27 (.66)	.059 (.064)	.18 (.88)
R^2		.129 (.124)		.052 (.02)		.028 (.105)	
N		99		86		98	

**** Significant at the .1% level (one-tailed test when the sign is predicted; two-tailed otherwise)
*** Significant at the 1% level (one-tailed test when the sign is predicted; two-tailed otherwise)
** Significant at the 5% level (one-tailed test when the sign is predicted; two-tailed otherwise)
* Significant at the 10% level (one-tailed test when the sign is predicted; two-tailed otherwise)

Table Nine: Multivariate Disclosure Changes Regressions

Panel B: Regression Models Using the Market Returns Based News Proxies

		CONTENT1-L (CONTENT2-L)		TIMING1-L (TIMING2-L)		PRESENT1-L (PRESENT2-L)	
Variable	Predicted Sign	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat
INTERCEPT	?	.147 (.120)	2.65*** (2.58)***	.177 (.022)	1.12 (.96)	.078 (-.007)	.94 (-.39)
CEXTFIN	+	.031 (.023)	.40 (.35)	-.046 (.027)	-.15 (.82)	.117 (.047)	1.02 (1.84)**
NEWSCHANGE-R	+	-.008 (-.006)	-.13 (-.11)	.064 (.007)	.37 (.25)	.019 (-.008)	.21 (-.39)
DSIZE	?	-.101 (-.082)	-1.61 (-1.56)	-.52 (-.024)	-.29 (-.92)	.008 (.025)	.08 (1.22)
DSIZE*CNEWSR	-	-.032 (-.037)	-.55 (-.77)	-.007 (.025)	-.04 (1.03)	-.063 (-.010)	-.73 (-.56)
CNEWSR	+	.033 (.038)	1.30* (1.77)**	-.085 (-.031)	-1.18 (-2.88)***	.037 (-.006)	.98 (-.76)
PNEWSR	-	.011 (.003)	.69 (.24)	.043 (.015)	.95 (2.11)**	.053 (.008)	2.18** (1.47)*
FNEWSR	+	-.043 (-.034)	-1.73* (-1.63)	-.024 (.009)	-.37 (.90)	-.044 (.002)	-1.20 (.21)
INDPERFR	+	.060 (.008)	.64 (.10)	.374 (.046)	1.44* (1.16)	.136 (.039)	.98 (1.26)
R^2 N		.114 (.112) 99		.071 (.169) 86		.113 (.105) 98	

**** Significant at the .1% level (one-tailed test when the sign is predicted; two-tailed otherwise)
*** Significant at the 1% level (one-tailed test when the sign is predicted; two-tailed otherwise)
** Significant at the 5% level (one-tailed test when the sign is predicted; two-tailed otherwise)
* Significant at the 10% level (one-tailed test when the sign is predicted; two-tailed otherwise)

REFERENCES

Aerts, W. 1994. On the use of accounting logic as an explanatory category in narrative accounting disclosures. *Accounting Organizations & Society* 19 (May-July): 337-353.

Ajzen, I. and M. Fishbein. 1980. *Understanding Attitudes and Predicting Social Behavior*. Englewood Cliffs, NJ: Prentice-Hall.

American Institute of Certified Public Accountants (AICPA). 1994. *Improving Business Reporting-A Customer Focus: A Comprehensive Report of the Special Committee on Financial Reporting*. New York: AICPA.

Amir, E. and B. Lev. 1996. Value-relevance of nonfinancial information: The wireless communications industry. *Journal of Accounting and Economics* 22 (August-December): 3-30.

Arthur Andersen. 1992.*The Valuation of Intangible Assets*. London: Arthur Andersen.

Baginski, S.P. and J.M. Hassell. 1997. Determinants of management forecast precision. *The Accounting Review* 72 (April): 303-312.

Bajkowski, J. 1996. In *Transcript of Proceedings of the SEC Symposium on Financial Accounting and Reporting of Intangible Assets, April 11 - 12, 1996*. Washington, D.C..: United States Securities and Exchange Commission.

Barrett, M.E. 1976. Financial reporting practices disclosure and comprehensiveness in an international setting. *Journal of Accounting Research* 14 (Spring): 10-26.

Belkaoui, A., and A. Kahl. 1978. *Corporate Financial Disclosure in Canada*. Vancouver, B.C.: Canadian Certified General Accountants' Association.

Belsey, D.A., Kuh, E., and Welsch, R.E. 1980. *Regression Diagnostics: Identifying Influential Data and Sources of Collinearity*. New York: John Wiley and Sons, Inc.

Bettman, J.R., and B.A. Weitz. 1983. Attributions in the board room: Causal reasoning in corporate annual reports. *Administrative Science Quarterly* 28 (June): 165-183.

Botosan, C.A. 1997. Disclosure level and the cost of equity capital. *The Accounting Review* 72 (July): 323-349.

Bozeman, D.P., and K.M. Kacmar. 1997. A cybernetic model of impression management processes in organizations. *Organizational Behavior and Human Decision Processes* 69 (January): 9-30.

Brancato, C.K. 1996. Executive summary of Conference Board Report 1118-95-RR: New corporate performance measures. In *Proceedings of the SEC Symposium on Financial Accounting and Reporting of Intangible Assets, April 11 - 12, 1996*. Washington, D.C.: United States Securities and Exchange Commission.

Brickley, J.A., R.C. Lease, and C.W. Smith. 1988. Ownership structure and voting on antitakeover amendments. *Journal of Financial Economics* 20: 267-291.

Brown, T.K. 1992. Straight talk from Wall Street. *American Banking Association Banking Journal* 84 (January): 43-48.

Buzby, S.L. 1975. Company size, listed versus unlisted stocks, and the extent of financial disclosure. *Journal of Accounting Research* 13 (Spring): 16-35.

Canadian Institute of Chartered Accountants (CICA). 1997. *CICA Handbook.*. Toronto: Canadian Institute of Chartered Accountants.

Canadian Institute of Chartered Accountants (CICA). 1991. *Information to be Included in the Annual Report to Shareholders*. Toronto: CICA.

Carnaghan, C.A., M. Gibbins, and S. Ikaheimo. 1996. Managed financial disclosure: the interplay between accountability pressures. In *Accountability: Power, Ethos and the Technologies of Managing* , ed. R. Munro and J. Mouritsen. London: International Thomson Business Press.

Cato, S. 1990. The ten best annual reports of 1989...and the ten worst. *Chief Executive (December): 27-37.*

Cerf, A. 1961. *Corporate Reporting and Investment Decisions*. Berkeley: University of California Press.

Chandra, G., and M.N. Greenball. 1977. Management reluctance to disclose: An empirical study. *Abacus* 13 (December): 141 - 154.

Chow, C.C., and A. Wong-Boren. 1987. Voluntary financial disclosure by Mexican corporations. *The Accounting Review* 62 (July): 533-541.

Clarkson, P.M., J.L. Kao, and G.D. Richardson. 1994. The voluntary inclusion of forecasts in the MD&A section of annual reports. *Contemporary Accounting Research* 11 (Fall): 423-450.

Clarkson, P.M., J.L. Kao, and G.D. Richardson. 1995. The quality of management discussion and analysis (MD&A): A voluntary disclosure perspective. Working paper, University of Waterloo, Waterloo, ON.

Cook, R.D., and S. Weisberg. 1982. *Residuals and Influence in Regression*. New York: Chapman and Hall.

Cooke, T.E. 1989. Disclosure in the corporate annual reports of Swedish companies. *Accounting and Business Research* 19 (Spring): 13-124.

Cowen, S.S., L.B. Ferreri, and L.D. Parker. 1987. The impact of corporate characteristics on social responsibility disclosure: A typology and frequency-based analysis. *Accounting, Organizations and Society* 12 (2): 111-122.

Cox, C.T. 1985. Further evidence on the representativeness of management earnings forecasts. *The Accounting Review* 60 (October): 692-703.

Craighead, J. and J. Hartwick. 1997. The effect of CEO disclosure beliefs on the volume of disclosure about corporate earnings and strategy. Working paper, Concordia University, Montreal, QE.

Degeorge, F., J. Patel, and R. Zeckhauser. 1999. Earnings management to exceed thresholds. *Journal of Business* 12 (Winter): 1-33.

Dutton, J. E. and J.M. Dukerich. 1991. Keeping an eye on the mirror: Image and identity in organizational adaptation. *Academy of Management Journal* 34 (Fall): 517-554.

Dye, R.A. 1985. Disclosure of nonproprietary information. *Journal of Accounting Research* 23 (Spring): 123-145.

Edwards, P. and R.A. Smith 1996. Competitive disadvantage and voluntary disclosures: the case of segmental reporting. *British Accounting Review* 28 (June): 155-172.

Egginton, D.A. 1990. Towards some principles for intangible asset accounting. *Accounting and Business Research* 20 (Summer): 193-205.

Elsbach, K.D. and R.I. Sutton. 1992. Acquiring organizational legitimacy through illegitimate actions: A marriage of institutional and impression management theories. *Academy of Management Journal* 35 (Fall): 699-738.

Entwistle, G. 1997. *Managing disclosure: The case of research and development in knowledge-based firms.* Ph.D. dissertation, University of Western Ontario.

Firth, M. 1979. The disclosure of information by companies. *The International Journal of Management Science* (7): 129-135.

Firth, M. 1980. Raising finance and firms' corporate reporting policies. *Abacus* 16 (June): 100-115.

Francis, J. 1993. Analysts' decisions as products of a multi-task environment. *Journal of Accounting Research* 31 (Autumn): 216-230.

Frankel, R., M. McNichols, and G.P. Wilson. 1995. Discretionary disclosure and external financing. *The Accounting Review* 70 (January): 135-150.

Gibbins, M,. and J.D. Newton. 1994. An empirical exploration of complex accountability in public accounting. *Journal of Accounting Research* 32 (Spring): 165 - 186.

Gibbins, M., A.J. Richardson, and J. Waterhouse. 1990. The management of corporate financial disclosure: Opportunism, ritualism, policies, and processes. *Journal of Accounting Research* 28 (Spring): 121 - 143.

Gibbins, M., A.J. Richardson, and J. Waterhouse. 1992. *The Management of Financial Disclosure: Theory and Perspectives.* CCGA Research Monograph, no. 20. Vancouver: The Canadian Certified General Accountants' Research Foundation.

Ginzel, L.E., R.M. Kramer, and R.I. Sutton. 1993. Organizational impression management as a reciprocal influence process: The neglected role of the organizational audience. In *Research in Organizational Behavior* 15: , ed. L.L. Cummings and B. M. Staw. Greenwich, CT: JAI Press: 227-266.

Govindarajan, V. 1980. The objectives of financial statements: An empirical study of the use of cash flows and earnings by security analysts. *Accounting Organizations and Society* 5 (4): 383-392.

Gray, S.J. and C.B. Roberts. 1989. Voluntary information disclosure and the British multinational: Corporate perceptions of costs and benefits. In *International Pressures for Accounting Change* , ed. A.G. Hopwood. Hertfordshire, United Kingdom: Prentice Hall International.

Grossman, S. 1981. The role of warranties and private disclosure about product quality. *Journal of Law and Economics* 24 (December): 461 - 483.

Healy, P., K. Palepu and A. Sweeney. 1995. Do firms benefit from expanded voluntary disclosure? Working paper, MIT Sloan School of Management, Cambridge, MA.

Hoffman, V.B. 1997. Accountability, the dilution effect, and conservatism in auditors' fraud judgements. *Journal of Accounting Research* 35 (Autumn): 227-237.

Hughes, M. A and D.E. Garrett. 1990. Intercoder reliability estimation approaches in marketing: A generalizability theory framework for quantitative data. *Journal of Marketing Research* 27 (May): 185-195.

Huth, W.L. 1992. Large and small firm stock price response to "Heard on the street" recommendations. *Journal of Accounting, Auditing & Finance* 7 (Winter): 27-47.

Iman, R.L. and W.J. Conover. 1979. The use of rank transformation in regression. *Technometrics* 21 (November): 499-509.

Indjejikian, R. J. 1991. The impact of costly information interpretation on firm disclosure decisions. *Journal of Accounting Research* 29 (Autumn): 277 - 301.

Ingram, R.W. and F.B. Frazier. 1983. Narrative disclosures in annual reports. *Journal of Business Research* 11 (March): 49-60.

Jennings, R. and R.B. Thompson II. 1996. Accounting for intangibles in the United States. *Issues in Accounting Education* 11 (Fall): 491-495.

Jobson, J.D. 1991. *Applied Multivariate Data Analysis Volume I: Regression and Experimental Design.* Springer-Verlag: New York.

Kang, N., A. Kara, H.A. Laskey and F.B. Seaton. 1993. A SAS MACRO for calculating intercoder agreement in content analysis. *Journal of Advertising* 22 *(June): 17-28.*

Kaznik, R. and B. Lev. 1995. To warn or not to warn: Management disclosures in the face of an earnings surprise. *The Accounting Review* 70 (January): 113-134.

Kennedy, J. 1995. Debiasing the curse of knowledge in audit judgment. *The Accounting Review* 70 (April): 249-273.

Knutson, P.H. 1993. *Financial Reporting in the 1990s and Beyond.* New York: Association for Investment Management and Research.

Kohut, G.F. and A.H. Segars. 1992. The president's letter to stockholders: An examination of corporate communication strategy. *Journal of Business Communication* 29 (Spring): 7-21.

Krippendorf, K. 1980. *Content Analysis.* Beverly Hills: Sage Publications.

Lang, M. and R. Lundholm. 1993. Cross-sectional determinants of analysts' ratings of corporate disclosures. *Journal of Accounting Research* 31 (Autumn): 246-271.

Leary, M.R. and R.M. Kowalski. 1990. Impression management: A literature review and two-component model. *Psychological Bulletin* 107 (January): 34-47.

Lev, B. 1992. Information disclosure strategy. *California Management Review* 34 (Summer): 9- 32.

Lev, B. 1996. The boundaries of financial reporting and how to extend them. In *Proceedings of the SEC Symposium on Financial Accounting and Reporting of Intangible Assets, April 11 - 12, 1996*. Washington, D.C.: United States Securities Exchange Commission.

Lev, B. and S.H. Penman. 1990. Voluntary forecast disclosure, nondisclosure, and stock prices. *Journal of Accounting Research* 28 (Spring): 49-76.

Lev, B. and T. Sougiannis. 1996. The capitalization, amortization, and value-relevance of R&D. *Journal of Accounting and Economics* 21: 107 - 138.

MacDonald, E. 1996. More firms write off acquisition costs. *Wall Street Journal* (December 2): A2.

Maines, L. 1995. Judgment and decision-making research in financial accounting: A review and analysis. In *Judgment and Decision-Making Research in Accounting and Auditing*, ed. R.H. Ashton and A.H. Ashton. Cambridge, United Kingdom: Cambridge University Press.

Marston, C.L. and P.J. Shrives. 1991. The use of disclosure indices in accounting research: A review article. *British Accounting Review* 23 (September): 195-210.

Mikhail, M.B., B.R. Walther, and R.H. Willis. 1999. Does forecast accuracy matter to security analysts. *The Accounting Review* 74 (April): 185-200.

Milgrom, P. 1981. Good news and bad news: Representation theorems and applications. *Bell Journal of Economics* 12 (Autumn): 380 - 391.

Myerson, R. 1979. Incentive compatibility and the bargaining problem. *Econometrica* 47 (January): 61 - 74.

Nelson Publications. 1997. Nelson's Directory of Investment Research (Volume II). Port Chester, NY: Nelson Publications.

Nisbett, R.E. and T.D. Wilson. 1977. Telling more than we can know: Verbal reports on mental processes. *Psychological Review* 8 (March): 231-259

Nunnally, J. 1967. *Psychometric Methods*. New York: McGraw-Hill.

Ontario Securities Commission - Office of the Chief Accountant (1993). *Management's Discussion & Analysis of Financial Condition and Results of Operations (MD&A) Guide parts I and II*. Toronto, ON: Ontario Securities Commission,

O'Reilly, R. 1996. SEC symposium on the financial accounting and reporting of intangible assets. *Proceedings of the SEC Symposium on Financial Accounting and Reporting of*

Intangible Assets, April 11 - 12, 1996. Washington, D.C.: United States Securities Exchange Commission.

Patel, P. and K. Pavitt. 1995. Patterns of technological activity: Their measurement and interpretation. In *Handbook of the Economics of Innovation and Technological Change*, ed. P. Stoneman. Oxford, United Kingdom: Blackwell.

Patten, D.M. 1991. Exposure, legitimacy, and social disclosure. *Journal of Accounting and Public Policy* 10 (Winter): 297 - 308.

Patton, J. and I. Zelenka. 1997. An empirical analysis of the determinants of the extent of disclosure in annual reports of joint stock companies in the Czech Republic. *The European Accounting Review* 6: 605-626.

Penman, S.H. 1980. An empirical investigation of the voluntary disclosure of corporate earnings forecasts. *Journal of Accounting Research* 18 (Spring): 132-160.

Phelps, R.H. and J. Shanteau. 1978. Livestock judges: How much information can an expert use? *Organizational Behavior and Human Performance* 21 (April): 209-219.

Previts, G., R. Bricker, T. Robinson, and S. Young. 1994. A content analysis of sell-side financial analyst company reports. *Accounting Horizons* 8 (June): 55-70.

Roberts, R.W. 1992 . Determinants of corporate social responsibility disclosure: An application of stakeholder theory. *Accounting, Organizations and Society* 17 (6): 595-612.

Ruland, W., S. Tung and N. George. 1990. Factors associated with the disclosure of managers' forecasts. *The Accounting Review* 65 (July): 710-721.

Russ, G.S. 1991. Symbolic communication and image management in organizations. In *Applied Impression Management: How Image-Making Affects Managerial Decisions* , ed. R.A. Giacalone and P. Rosenfeld. Newbury Park, CA: Sage Publications.

Salancik, G.R., and J.R. Meindl. 1984. Corporate attributions as strategic illusions of management control. *Administrative Science Quarterly* 29 (June): 238-254.

Saloman, J.S. 1996. A regulator's perspective. In *Proceedings of the SEC Symposium on Financial Accounting and Reporting of Intangible Assets, April 11 - 12, 1996.* Washington, D.C.: United States Securities Exchange Commission.

Schipper, K. 1991. Commentary on analysts' forecasts. *Accounting Horizons* 5 (December): 105-121.

Schlenker, B.R. 1980. *Impression Management: The Self-Concept, Social identity, and Interpersonal Relations.* Monterey, CA: Wadsworth.

Siegal, A. 1996. Paper based on presentation on improving the reporting of intangible assets. In *Proceedings of the SEC Symposium on Financial Accounting and Reporting of Intangible Assets, April 11 - 12, 1996.* Washington, D.C.: United States Securities Exchange Commission.

Singhvi, S.S., and H.B. Desai. 1971. An empirical analysis of the quality of corporate financial disclosure. *The Accounting Review* 46 (January): 129-138.

Skinner, D.J. 1994. Why firms voluntarily disclose bad news. *Journal of Accounting Research* 32 (Spring): 38-60.

Software Publishers Association (SPA). 1996. Letter to Financial Accounting Standards Board regarding SFAS 86. In *Proceedings of the SEC Symposium on Financial Accounting and Reporting of Intangible Assets, April 11 - 12, 1996.* Washington, D.C.: United States Securities Exchange Commission.

Sonnelitter, R.J. 1996. Presentation to symposium on the financial accounting and reporting of intangible assets. In *Proceedings of the SEC Symposium on Financial Accounting and Reporting of Intangible Assets, April 11 - 12, 1996.* Washington, D.C.: United States Securities Exchange Commission.

SRI International. 1987. *Investor Information Needs and the Annual Report.* Morristown, NJ: Financial Executives Research Foundation

Stewart, T.A. 1994. Measuring company I.Q. *Fortune* , 24 January, 24.

Stewart, T.A. 1995. Trying to grasp the intangible. *Fortune* , 2 October, 105-107.

Sutton, R. and A.L. Callahan. 1987. The stigma of bankruptcy: Spoiled organizational image and its management. *Academy of Management Journal* 30 (Summer): 405-436.

Tasker, S. 1997. Voluntary disclosure as a response to low accounting quality: Evidence from quarterly conference call usage. Working Paper, MIT Sloan School of Management, Cambridge, MA.

Tetlock, P.E. 1983. Accountability and complexity of thought. *Journal of Personality and Social Psychology* 45 (July): 74-83.

Tetlock, P.E. 1985. Accountability: The neglected social context of judgment and choice. In *Research in Organizational Behavior* , ed. B. Staw, no. 7 . Greenwich, CT: JAI Press.

Tetlock, P.E. 1992. The impact of accountability on judgment and choice: Toward a social contingency model. In *Advances In Experimental Social Psychology* , ed. M.P. Zanna, no. 25. San Diego: Academic Press, Inc.

Tetlock, P.E and S.R. Manstead. 1985. Impression management versus intrapsychic explanations in social psychology: A useful dichotomy?. *Psychological Review* 92 (July): 59-77.

Tetlock, P.E., L. Skitka, and R. Boettger. 1989. Social and cognitive strategies for coping with accountability: Conformity, complexity, and bolstering. *Journal of Personality and Social Psychology* 57 (October): 632-640.

Thomas, A.P. 1989. The effects of organisational culture on choices of accounting methods. *Accounting and Business Research* 19: 363-378.

Toronto Stock Exchange. 1995. *Toward Improved Disclosure: A Search for Balance in Corporate Disclosure.* Toronto, ON: Toronto Stock Exchange.

Verrecchia, R. E. 1983. Discretionary disclosure. *Journal of Accounting and Economics* 5 (December): 179 - 194.

Wagenhofer, A. 1990. Voluntary disclosure with a strategic opponent. *Journal of Accounting and Economics* 12 (March): 341-363.

Wallman, S. M. H. 1995. The future of accounting and disclosure in the evolving world: The need for dramatic change. *Accounting Horizons* 9 (September): 81-91.

Weigold, M.F., and B.R. Schlenker. 1991. Accountability and risk taking. *Personality and Social Psychology Bulletin* 17 (February): 25-29.

White, H. 1980. A Heteroskedasticity-Consistent Covariance Matrix Estimator and a Direct Test for Heteroskedasticity. *Econometrics* 48: 817 -838.

United States Securities Exchange Commission. 1996. *Proceedings of the SEC Symposium on Financial Accounting and Reporting of Intangible Assets April 11 - 12, 1996*. Washington, D.C.

Zeghal, D., and S.A. Ahmed. 1990. Comparison of social responsibility information disclosure media used by Canadian firms. *Accounting, Auditing and Accountability Journal* 3: 38-53.

				1	9	9	2	1	9	9	3	1	9	9	4
				prov past	qual/quant p	prov fut	qual/quant f	prov past	qual/quant p	prov fut	qual/quant f	prov past	qual/quant p	prov fut	qual/quant f
1			**Goals/Objectives/Strategies**												
1	1		R&D directions or goals are provided (must be *specific* technology directions/goals that indicate product lines/technology to be developed, not market or current product descriptions)												
1	2		An R&D strategy to acheive goals is provided (leveraging of existing products/expertise, use of partnerships, dev't of infrastructure. funding priorities) (other than generic statements - must specify *how* goals will be acheived)												
1			Subtotals												
1	x		Other R&D goal/strategy information - not scored (e.g. external events/assumptions crucial to goal acheivement)												
2			**Environment**												
2	1		Information on *product* relevant R&D/technology trends/dev'ts/issues are discussed												
2	2		*The competitive environment (incl. posn in industry and product market)*												
2	2	1	Changes/trends/issues in existing product markets or the company's industry are discussed (e.g regulatory changes, market size changes, product market economic factors, changes in competition,specific risks/opportunities, prod mkt tech changes)												
2	2	2	Intended markets for products/technology are clearly identified (e.g. type of customer or need, new mkts emerging) (no points for very broad or obvious market descriptions)												
2	2	3	The size of the existing potential product markets is provided (give point for 2.2.2 as well) (mkt size must be stated)												
2	2	4	Company's product market share is provided (give points for 2.2.2 as well) (mkt shr must be stated)												
2	2	5	Changes in company's market share is provided (give points for 2.2.2. as well) (mkt shr must be stated)												
2	2	6	Change in product pricing is provided (incl effects of competition/barriers to entry on pricing)												
2	2	7	Extent of dependence on a few customers/distributors is provided (e.g. % of sales from % of customers)												
2	2	8	Competition is identified by name												

NB: This is modified from the actual format used in that it includes only three rather than five years so as to fit on the page in portrait orientation

				1	9	9	2	1	9	9	3	1	9	9	4
				prov past	qual/quant p	prov fut	qual/quant f	prov past	qual/quant p	prov fut	qual/quant f	prov past	qual/quant p	prov fut	qual/quant f
2	2	9	Competition's relative abilities or products are mentioned (competition or product must be named)												
2			Subtotals												
2	x		Other environmental/goal information provided (but not scored) (list below)												
3			**Input (Resource) Information**												
3	1		Total number of employees is identified												
3	2		Functional responsibilities of senior R&D personnel are provided												
3	3		A projection of R&D expenditures is provided												
3	4		Specific planned uses of financing money from debt or equity is provided (excl. gov't credits)												
3	5		Significant production/commercialization or research agreements are identified (partner must be named)(not incl. sales contracts) (e.g. joint ventures, commercln agrmnts, and partnerships for research and development))												
3	6		Measures of physical level of output or capacity utilization of manufacturing plant are provided												
3	7		Discussion of general marketing and distribution systems is provided (e.g direct sales versus VARs, planned or actual use of distribution agreements)												
3	8		Specific marketing/distribution agreements/partnerships are named												
3			Subtotals												
3	x		(e.g.# of R&D employees; expl for change in R&D exp):												
4			**Progess Information**												
4	1		Research or products being developed are identified (incl. planned new products/enhancements) (if compl. ambigious, count as a new product, rather than in progress) (code more general statemetns of direction as 1.1.)												
4	2		Expected features/capabilities of products in progress are described (pts for 4.1 as well)												
4	3		Status of research/products being developed is provided, e.g. stage of development or when completion expected (specific timelines/dates would be numeric disclosure) (pts for 4.1 as well)												
4			Subtotals												

NB: This is modified from the actual format used in that it includes only three rather than five years so as to fit on the page in portrait orientation

				1	9	9	2	1	9	9	3	1	9	9	4
				prov past	qual/quant p	prov fut	qual/quant f	prov past	qual/quant p	prov fut	qual/quant f	prov past	qual/quant p	prov fut	qual/quant f
4	x		Additional progress disclosures (not scored):												
5			**Output (Product) Information**												
5	*1*		*Existing product lines/products*												
5	1	1	The main product lines/products are identified												
5	1	2	The features/capabilities of products/product lines are described (pts for 5.1.1 as well)												
5	*2*		*New product lines/products*												
5	2	1	New products or changes to existing products are identified (Incl acqs)												
5	2	2	The features/capabilities of the new product or product lines are described (pts for 5.2.1 as well)												
5			Subtotals												
5	x		Other output items disclosed:												
6			**Benefits Information**												
6	*1*		*Sales revenue information*												
6	1	1	3-5 years of historical product sales revenue is provided												
6	1	2	6-10 years of historical product sales revenue is provided (give points for 6.1.1 as well)												
6	1	3	Sales revenue figures are provided by major product line/product (other than new products)												
6	1	4	Change in proportion of sales revenue or change in revenue by major product line is provided												
6	1	5	Amount of sales revenue from new products or other age of product breakout is provided												
6	1	6	Change in *proportion* of revenue from new products is provided												
6	2		Number of units sold for year is provided (outside of sales contract information)												
6	3		Information about size of order backlog is provided												
6	*4*		*Earnings information (earnings, operating margins, etc)*												
6	*4*	1	3-5 years of historical earnings is provided												
6	*4*	2	6-10 years of historical earnings is provided (give points for 6.4.1 as well)												

NB: This is modified from the actual format used in that it includes only three rather than five years so as to fit on the page in portrait orientation

				1	9	9	2	1	9	9	3	1	9	9	4
				prov past	qual/quant p	prov fut	qual/quant f	prov past	qual/quant p	prov fut	qual/quant f	prov past	qual/quant p	prov fut	qual/quant f
6	4	3	Earnings are provided by major product line/product (other than new products)												
6	4	4	Change in proportion of earnings or change in earnings by major product line/product is provided												
6	4	5	Gross margin (i.e. sales and cost of goods sold) information is provided or calculable (check fin. statements and notes as well)												
6	5		A cash flow or earnings projection is provided (incl comparisons to future expectations)												
6			Subtotals												
6	x		Other R&D benefits disclosures (not scored) e.g. specific major sales contracts, install sites, intra-industry relative sales/earnings indicators) :												
			TOTALS												

NB: This is modified from the actual format used in that it includes only three rather than five years so as to fit on the page in portrait orientation